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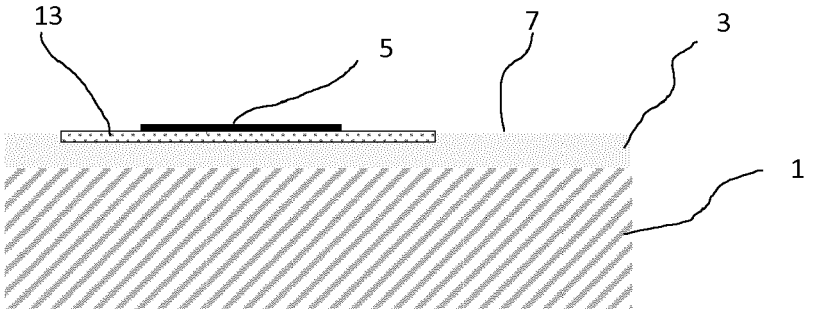
(54) **A METHOD FOR MANUFACTURING A WALL OF A HOUSEHOLD APPLIANCE AND HOUSEHOLD APPLIANCE**

(57) The present invention relates to a method for manufacturing a wall of a household appliance, in particular of a cooking appliance, more in particular of a cooking hob. The wall has a base structure or base layer (1) and a surface, in particular an outer surface, which receives or has received a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic. According to the invention, at least one printing (5) is applied to the surface and the printing material does not touch the base structure or base layer (1).

Further, a household appliance, in particular a cooking appliance, more in particular a cooking hob is disclosed. The household appliance has a wall with a base structure or base layer (1) and a surface, particularly an outer surface, which has a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic. At least one printing (5) is arranged at the surface and the printing material (5) does not touch the base structure or base layer (1).

FIG 5



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Description

[0001] The present invention relates to a method for manufacturing a wall of a household appliance, in particular of a cooking appliance, more in particular of a cooking hob according to the preamble of claim 1. The present invention further relates to a household appliance according to the preamble of claim 9.

[0002] Currently, in the manufacturing process of household appliances comprising metallic sheets or walls which, besides mechanical functionality, also have an aesthetic appearance and which are treated by their users by touching, such metallic sheets or walls are equipped with a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic as well as with specific printing for applying product name and/or symbols for a user interface. Different approaches are known for performing blank metal sheets or walls with such characteristic. One approach provides a functional coating which results in said self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic and which is applied on the sheet or wall after forming, i. e. after a stamping or embossment step. In an alternative solution, the functional coating may be applied to the blank metal sheet prior to any treatment step like stamping or embossment. This alternative solution allows a significant cost advantage over the first approach, due to simplified logistics in terms of transportation costs and component codes fragmentation. On the other hand, this alternative solution may result in corrosion problems on the metal sheet, even in case of using stainless steel material, when the functional coating is removed for applying the printing on the wall. Alternatively, in case of not removing the coating, the printing may be non-durable due to lack of adhesion of the printing material. Further, the aesthetical appearance may suffer from the printing on the coating and/or the surface may lose its self-cleaning or easy-to-clean effect.

[0003] It is an object of the present invention to provide a method for manufacturing a wall of a household appliance as well as a household appliance which overcomes the above-described disadvantages.

[0004] The object is achieved for a method for manufacturing a wall of a household appliance according to the preamble of claim 1 by the features of the characterizing part of claim 1.

[0005] A method for manufacturing a wall of a household appliance, in particular of a cooking appliance, more in particular of a cooking hob, the wall having a base structure or base layer and a surface, in particular an outer surface, is provided. The surface receives or has received a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic. According to the present invention, at least one printing is applied to the surface, the printing material not touching the base structure or base layer. By applying at least one printing or printing material to the surface, which does not touch the base structure or base layer, a surface with slightly aesthetical appearance and continuous self-cleaning and/or easy-to-clean and/or hydrophobic effect or characteristic is provided.

[0006] The base structure or base layer is preferably a metal sheet, particularly a stainless steel sheet. The self-cleaning and/or easy-to-clean and/or hydrophobic characteristic may be generated on blank sheet material.

[0007] In a specific arrangement, the self-cleaning and/or easy-to-clean and/or hydrophobic effect or characteristic is received by means of a self-cleaning coating and/or an easy-to-clean coating and/or a hydrophobic coating which is applied to the surface.

[0008] The printing material may be applied to an exposed surface of the self-cleaning coating and/or of the easy-to-clean coating and/or of the hydrophobic coating. Said exposed surface may be arranged at the coating opposite to the boundary surface adjacent the base structure or base layer.

[0009] In a preferred embodiment, an activation process is performed on the self-cleaning coating and/or the easy-to-clean coating and/or the hydrophobic coating prior to applying the printing material. The activation process preferably increases the surface tension.

[0010] A preferred embodiment is characterized by an activation process which is performed using plasma technology. Particularly, a plasma technology gun or pin is used, moving on or above the area to be treated and performing the activation process passing over said area.

[0011] In order to perform a quick and cost-efficient treatment, the activation process may be performed by limiting to the area or areas receiving a printing. Hence, areas without any printing may be excluded from such treatment. In order to reach this target, blank or non-printed areas may be covered by means of respective cover elements or cover means. Alternatively, the plasma technology gun or pin may be deactivated when passing over the blank or non-printed areas.

[0012] In particular, the printing is based on ink application technology, preferably using serigraphy or tampography.

[0013] The object is achieved for a household appliance according to the preamble of claim 9 by the features of the characterizing part of claim 9.

[0014] A household appliance, in particular a cooking appliance, more in particular a cooking hob, is provided which has a wall with a base structure or base layer and a surface, particularly an outer surface. The surface has a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic. According to the invention, at least one printing is arranged at the surface and the printing material does not touch the base structure or base layer.

[0015] The base structure or base layer may be a metal sheet, preferably a stainless steel sheet.

[0016] Preferably, the self-cleaning and/or the easy-to-clean and/or the hydrophobic characteristic is not interrupted or disrupted at the area or areas with printing.

[0017] According to an embodiment, a self-cleaning coating and/or an easy-to-clean coating and/or a hydro-

phobic coating is arranged between the base structure or base layer and the printing material.

[0018] A preferred embodiment is characterized by a printing which is based on ink application technology, preferably applied by means of serigraphy or tampography.

[0019] Novel and inventive features of the present invention are set forth in the appended claims.

[0020] The present invention will be described in further detail with reference to the drawings, in which

FIG 1 is a sectional view of a small section of a wall of a household appliance before receiving any printing;

FIG 2 illustrates a first disadvantageous solution for printing on the wall section of FIG 1;

FIG 3 illustrates a second disadvantageous solution for printing on the wall section of FIG 1;

FIG 4 illustrates a first, and preparative, step of the inventive solution for printing on the wall section of FIG 1; and

FIG 5 illustrates a second, and final, step of the inventive solution for printing on the wall section of FIG 1.

[0021] FIG 1 illustrates a sectional view on a small section of a wall of a household appliance. By way of example, the small section represent a cutout of a user interface area arranged on a worktop of a cooking hob which may be a conventional electric hob or a gas hob. The wall or worktop is made of a metal sheet 1 which is formed out of a flat metal plate material, e. g. a stainless steel plate, by stamping and embossing. Its outer or upper surface, which is facing the user and which is exposed to the user's touching, is covered, at least in the area of a user interface of the household appliance, with a coating 3, which has a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic or effect in order to meet the user's desire for a low-maintenance appliance.

[0022] Mainly for the purpose of applying a product name on the household appliance and/or symbols on a user interface thereof, a printing 5 is arranged on the wall. The printing is realized with a traditional ink application technology, in particular by means of serigraphy or tampography.

[0023] The printing 5 may be applied on the outer surface 7 of the coating 3 as illustrated with FIG 2. Such solution, however, is unfavourable with respect to a durability of the printing since the printing 5 is lacking adhesion of the ink due to the hydrophobic behaviour of the coated surface 7 when using traditional serigraphy or tampography.

[0024] In order to overcome the afore-described lack of adhesion, an alternative solution is illustrated with FIG 3. This alternative solution is characterized by a removal of the coating 3 in the area of printing 5. The coating removing process is usually executed by means of laser technology. A laser beam 9 cuts out the area where the printing 5 shall be placed prior to the application of ink for performing the printing process. The coating 3 is removed completely down to the upper or outer surface 11 of the blank metal sheet 1. The metal sheet surface 11 is suitable for enabling a durable printing thereon. This solution, however, is more expensive than the solution according to FIG 2. Moreover, due to the laser-supported removal of the coating 3, corrosion may occur later on due to lack of a corrosion protection effect by the coating 3.

[0025] The problems occurring with the solutions according to FIGs 2 and 3 are solved with a two-step printing process.

[0026] The manufacturing of a wall of a household appliance, e. g. of a worktop of a cooking hob, is started with a blank metal sheet 1, in particular a stainless steel plate, on which a self-cleaning and/or an easy-to-clean and/or a hydrophobic coating 3 is applied. This allows a faster and more effective application. A user interface application is performed in a second step, after stamping the wall or worktop. The user interface application is realized with a well-known ink application process based on serigraphy or tampography, however, according to the invention, by means of a two-step application process.

[0027] A first step thereof is illustrated with FIG 4. In order to cause the ink to adhere to the coated surface, a preliminary activation process is performed on the user interface area using a plasma technology pin or gun which moves on the selected area 13 to be treated. The process increases locally the surface tension and the activation lasts for some days, allowing a convenient application of symbols, marking or lettering with traditional ink technologies.

[0028] Said ink application step, the second printing step, is shown with FIG 5. According to a printing pattern, ink 5 is applied on the destined area. As illustrated, the respective surface, i. e. the selected area 13, is prepared for a durable reception of the printing ink 5, which preparation has been performed with the first step, as described above. The preparation resulted in the provision of the selected area 13 or receiving area which may protrude the area for the printing 5, as can be seen in FIG 5.

[0029] Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawing, it is to be understood that the present invention is not limited to that precise embodiment, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope or spirit of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

List of reference numerals

[0030]

1	metal sheet
3	coating
5	printing / ink
7	outer surface of coating
9	laser beam
11	metal sheet surface
13	selected area

Claims

1. A method for manufacturing a wall of a household appliance, in particular of a cooking appliance, more in particular of a cooking hob, the wall having a base structure or base layer (1) and a surface, in particular an outer surface, the surface receiving or having received a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic, **characterized in that** at least one printing (5) is applied on the surface, the printing material (5) not touching the base structure or base layer (1).

2. The method according to claim 1, **characterized in that** the base structure or base layer (1) is a metal sheet, preferably a stainless steel sheet, wherein the self-cleaning and/or easy-to-clean and/or hydrophobic characteristic is generated on blank sheet material.

3. The method according to claim 1 or 2, **characterized in that** a self-cleaning coating and/or an easy-to-clean coating and/or a hydrophobic coating (3) is applied to the surface (11).

4. The method according to claim 3, **characterized in that** the printing material (5) is applied to an exposed surface (7) of the self-cleaning coating and/or of the easy-to-clean coating and/or of the hydrophobic coating (3), which surface (7) is opposite to the boundary surface adjacent the base structure or base layer (1).

5. The method according to anyone of the preceding claims, **characterized in that** an activation process is performed on the self-cleaning coating and/or the easy-to-clean coating and/or the hydrophobic coating (3) prior to applying the printing material (5), the activation process preferably increasing the surface tension.

6. The method according to claim 5, **characterized in that** the activation process is performed using plasma technology, in particular by means of a plasma technology gun or pin moving on or above the area (13) to be treated.

7. The method according to claim 5 or 6, **characterized in that** the activation process is performed by limiting to the area (13) or areas receiving a printing (5), in particular covering blank or non-printed areas by means of respective cover elements or cover means.

8. The method according to anyone of the preceding claims, **characterized in that** the printing is based on ink application technology, preferably using serigraphy or tampography.

9. A household appliance, in particular a cooking appliance, more in particular a cooking hob, having a wall with a base structure or base layer (1) and a surface, particularly an outer surface, the surface having a self-cleaning and/or an easy-to-clean and/or a hydrophobic characteristic, **characterized in that** at least one printing (5) is arranged at the surface, the printing material (5) not touching the base structure or base layer (1).

10. The household appliance according to claim 9, **characterized in that** the base structure or base layer (1) is a metal sheet, preferably a stainless steel sheet.

11. The household appliance according to claim 9 or 10, **characterized in that** the self-cleaning and/or the easy-to-clean and/or the hydrophobic characteristic is not interrupted or disrupted at the area or areas with printing (5) .

12. The household appliance according to anyone of the claims 9 to 11, **characterized in that** a self-cleaning coating and/or an easy-to-clean coating and/or a hydrophobic coating (3) is arranged between the base structure or base layer (1) and the printing material (5).

13. The household appliance according to anyone of the claims 9 to 12, **characterized in that** the printing (5) is based on ink application technology, preferably applied by means of serigraphy or tampography.

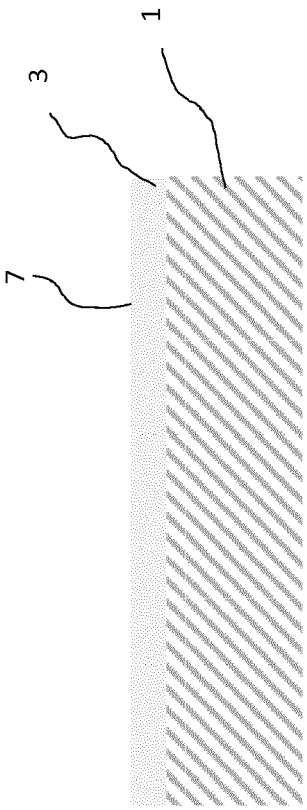

FIG 1

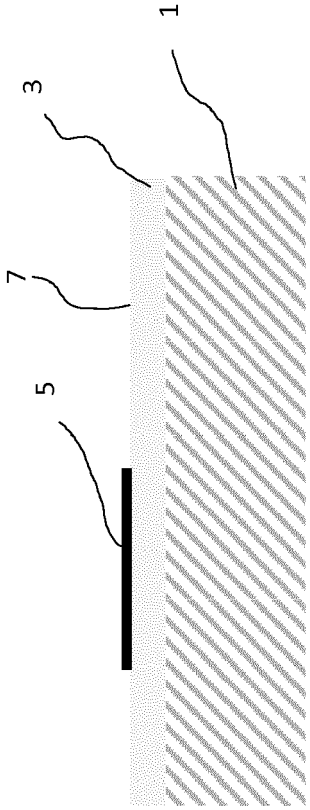

FIG 2

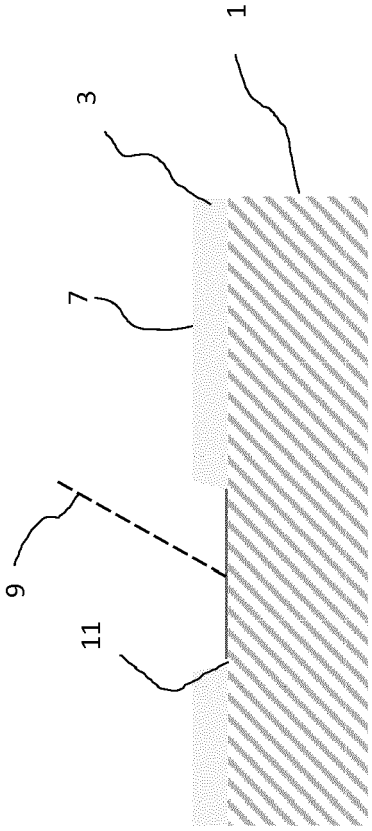

FIG 3

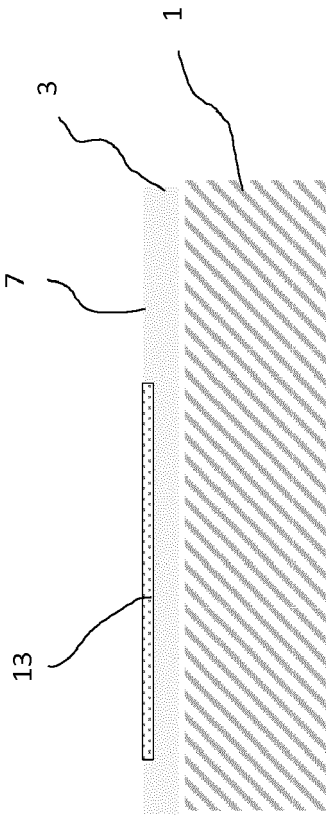

FIG 4

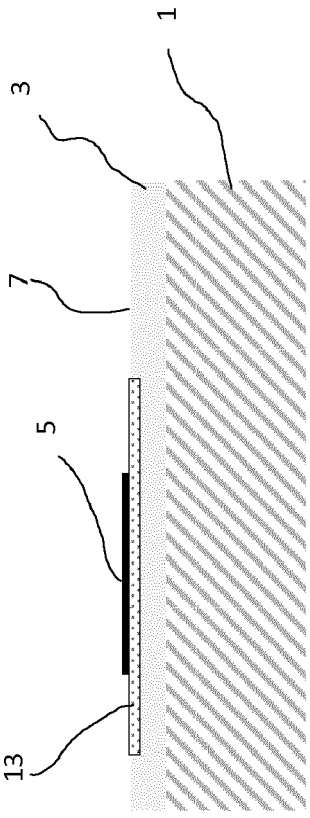

FIG 5

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 5129

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TECHNICAL FIELDS SEARCHED (IPC)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 September 2019	Rodriguez, Alexander

CATEGORY OF CITED DOCUMENTS

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