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(54) Sanding block

(57) A block, particularly for sanding treatments, comprising at least one grip surface (2) for an operator and at least one anchoring surface (3) for an abrasive surface that is adapted for sanding, the abrasive surface being chosen preferably between an abrasive sheet and an abrasive disk. The block is substantially constituted by at least one handpiece (4), which is provided with the grip surface (2), at least one interchangeable plate (5), which is provided with the anchoring surface (3) and means (6) for the mutual and detachable coupling of the handpiece (4) and of the plate (5). The coupling means (6) are distributed on a substantially perimetric region of respective mating areas provided on at least one between the handpiece (4) and the plate (5).

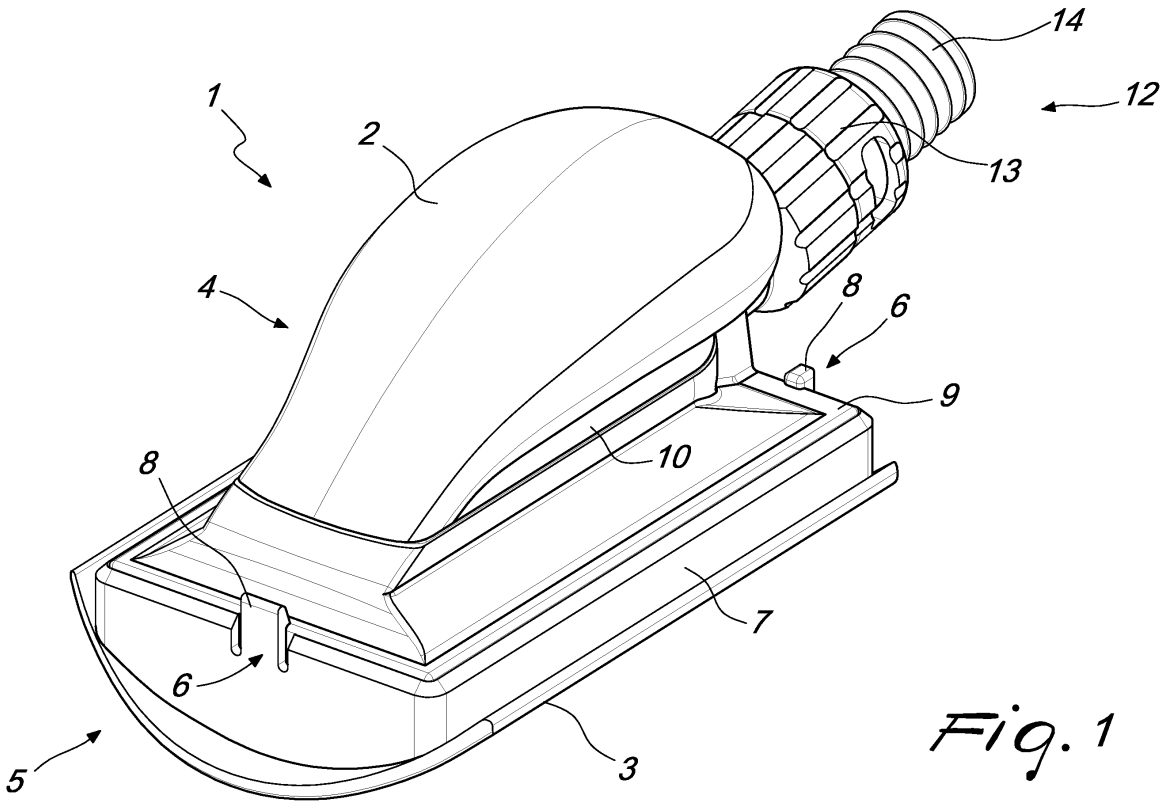


Fig. 1

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Description

[0001] The present invention refers to a block, particularly for sanding treatments.

[0002] It is widely known that sanding is a surface treatment to which products of the automobile, furniture, sailing industries et cetera, are subjected, and consists in the polishing, by means of abrasive sheets, of surfaces from which it is desired to remove residues of paint and of previous processing, and more in general it serves to make the treated parts smooth.

[0003] Therefore, blocks are widely available on the market which are constituted of a support block, one face of which is provided with a layer of adhesive material or of VELCRO® (which is a registered trademark), so as to allow the abrasive sheet to be applied on it.

[0004] According to many solutions, the face that is intended to receive the abrasive sheet has curvatures of various different types, so as to adapt to the specific geometry of the surfaces to be treated.

[0005] In particular, some makers have marketed blocks that are constituted by a main body that is generally box-like in shape, one surface of which can be made to adhere (generally with VELCRO®) to an interchangeable plate, and it is on this plate that the face, having a predefined curvature, which is intended to receive the abrasive sheet is provided.

[0006] Therefore, in order to vary the field of application of such blocks, or simply so as to be able to use them on objects that have different shapes, it is sufficient to substitute the plate with another plate that has a different shape.

[0007] Such a solution is not, however, without drawbacks.

[0008] First and foremost, the choice to use VELCRO® to provide the coupling between the main body and the plate leads to the fact that the block does not last very long over time, since, as is known, strips of VELCRO® are subject to deterioration over time, with consequent loss of effectiveness.

[0009] In addition, if it is required or preferable, according to the specific application, to remove, by aspiration, the dust produced during sanding, it is very complex, if not impossible, to equip the body and plates with the necessary holes and channels (which must be made in perfect mutual alignment on both components).

[0010] The aim of the present invention is to solve the above mentioned drawbacks, by providing a block that is simple and easy to use and which ensures a high level of reliability in operation over time and even after prolonged use.

[0011] Within this aim, an object of the invention is to provide a block that enables, in a practical manner, the removal by aspiration of the dust produced during sanding.

[0012] Another object of the invention is to provide a block that offers the possibility to be used on different types of surface.

[0013] A further object of the invention is to provide a kit that makes it possible to sand surface portions that have different curvatures, in accordance with the various different geometries of the areas that can be treated.

[0014] A further object of the invention is to provide a block that can be easily provided starting from elements and materials that are easily sourced on the market.

[0015] A further object of the invention is to provide a block that can be made at low cost and applied safely.

[0016] This aim and these and other objects which will become better apparent hereinafter are achieved by a block, particularly for sanding treatments, comprising at least one grip surface for an operator and at least one anchoring surface for an abrasive surface adapted for sanding, said abrasive surface being chosen preferably between an abrasive sheet and an abrasive disk, **characterized in that** it is constituted substantially by at least one handpiece, which is provided with said grip surface, at least one interchangeable plate, which is provided with said anchoring surface, and means for the mutual and detachable coupling of said handpiece and of said plate, said coupling means being distributed on a substantially perimetric region of respective mating areas provided on at least one between said handpiece and said plate.

[0017] One of these objects is also achieved by means of a kit, particularly for sanding, **characterized in that** it comprises at least one handpiece, which has a grip surface for an operator and a plurality of interchangeable plates which have respective anchoring surfaces for an abrasive sheet that is adapted for sanding, along perimetric regions of respective mating areas provided on at least one between said handpiece and each one of said plates, there being means for mutual and detachable coupling, for mutual mating adapted to form a block adapted for sanding, each anchoring surface of each one of said plates having different curvatures in accordance with the different geometries of the areas that can be treated.

[0018] Further characteristics and advantages of the invention will become better apparent from the following detailed description of six preferred, but not exclusive, embodiments of the block according to the invention, illustrated by way of non-limiting examples in the accompanying drawings, wherein:

Figure 1 is a perspective view of a block according to the invention, in a first embodiment;

Figure 2 is a perspective view of the plate of the block of Figure 1;

Figure 3 is a front elevation view of the plate of the block of Figure 1;

Figures from 4 to 8 are front elevation views of five respective plates, according to five further corresponding embodiments.

[0019] With reference to the figures, a block according to the invention, which is generally designated by the reference numeral 1, is particularly adapted to sanding

treatments, i.e. operations to polish parts (for example in order to remove scratches or processing residues from painted areas) by means of abrasive paper, sandpaper and the like.

[0020] Sanding treatments therefore constitute the preferred application of the block 1 according to the invention, and it is to such application that reference will be made hereinafter in this discussion. However, different applications of the block 1 are not excluded, which however fall within the scope of protection claimed herein in accordance to the specific requirements.

[0021] The block 1 according to the invention comprises at least one grip surface 2 for allowing an operator to hold it and at least one anchoring surface 3 upon which an abrasive surface can be fixed that is adapted for sanding, such abrasive surface being chosen preferably between an abrasive sheet and an abrasive disk (the use of different types of abrasive surfaces is, however, not excluded).

[0022] According to the invention, the block 1 is substantially constituted by at least one handpiece 4, which is provided with the grip surface 2, at least one interchangeable plate 5, which is provided with the anchoring surface 3, and means 6 for the mutual and detachable coupling of the handpiece 4 and of the plate 5.

[0023] The coupling means 6 are distributed on a substantially perimetric region of respective mating areas provided on at least one between the handpiece 4 and the plate 5.

[0024] In particular, according to an embodiment of important practical interest, which is described for the purposes of non-limiting illustration of the application of the invention, the plate 5 is substantially constituted by the anchoring surface 3, which has a curvature that is adapted to sand specific products, and by a frame 7 that is substantially perpendicular to the perimeter of the anchoring surface 3.

[0025] It is therefore the free top 7a of the frame 7 just described that defines the perimetric region concerned by the coupling means 6.

[0026] More specifically, the coupling means 6 comprise at least two hooks 8 which are arranged along the free top 7a of the frame 7 and which can engage elastically against respective abutments defined along the respective mating area of the handpiece 4, which in turn is arranged on the opposite side with respect to the grip surface 2.

[0027] In the various different embodiments shown in the accompanying figures, there are three hooks 8, one of which is positioned on one of the four sides of the frame 7 while the other two are positioned on the opposite side: each of such hooks can engage with a protrusion 9 which develops from the handpiece 4 from the opposite side with respect to the grip surface 2.

[0028] As can be seen in particular from Figure 1, the handpiece 4 is in turn constituted by a secondary block 10 that has a box-like shape, which has a first face that is shaped in an ergonomic manner, to define the grip surface 2. On the opposite side with respect to the grip surface 2, the handpiece 4 has a second face that is substantially flat and which defines the above mentioned mating area of the handpiece 4 and from which emerges the protrusion 9 upon which the hooks 8 engage.

[0029] The handpiece 4 can be made from any material, of any hardness, compatibly with specific requirements and field of application; purely for the purposes of example the possibility is mentioned of using plastics, while not excluding other embodiments that require the adoption of different materials.

[0030] Usefully, the block 1 according to the invention comprises a circuit for aspirating the dust produced during sanding, in order to allow its automatic evacuation.

[0031] In particular, the aspiration circuit comprises a channel formed along the handpiece 4 and a plurality of holes 11 formed along the anchoring surface 3; the channel leads, on the other side, to a mouth 12 that can be associated with a device for generating vacuum.

[0032] With reference to the preferred embodiment, shown in Figure 1, at the mouth 12 there is a rotatable joint 13 that makes it possible to connect the channel to a tube 14 which in turn can be associated with the above mentioned vacuum generating device.

[0033] To allow the passage of dust following the aspiration, the plurality of holes 11 constitutes a network of channels with a plurality of through openings made on the abrasive surfaces that can be associated with the anchoring surface 3.

[0034] Such abrasive surfaces can be fixed to the anchoring surface 3 according to different methods, for example using known methods, such as glues or adhesive tapes to be applied to the anchoring surface 3 and/or to the abrasive sheet/disk (on the opposite side with respect to the abrasive side).

[0035] According to a different embodiment, the anchoring surface 3 is instead provided with strips of VELCRO®, which can be mated with similar bands arranged on the abrasive sheets (or disks).

[0036] The use of the block according to the invention is as follows.

[0037] Faced with the necessity to sand a determined portion of the surface of an element, for example the body shell of an automobile, but equally furniture or other type of surface, it is possible to use the block 1, mating the handpiece 4 and the plate 5 to each other.

[0038] The ease of mutual mating between the handpiece 4 and the plate 5 is ensured by the choice to use simple coupling means 6 arranged along the perimetric regions of the mating areas.

[0039] With reference to the preferred embodiment, it is in fact sufficient to apply a slight pressure on the handpiece 4 against the plate 5 to force an elastic deformation of the hooks 8 and so enable the protrusion 9 to fit onto the frame 7 while it is held in position by the hooks 8.

[0040] The coupling means 6 such as those described ensure the repeatability over time of the coupling and decoupling operations, so avoiding the danger of wear

of the components or of deterioration of the parts, as indeed often happens when using known types of block.

[0041] As observed, it is on the interchangeable plate 5 that the anchoring surface 3 is defined, such anchoring surface being intended to receive the abrasive sheet (or disk). The ability to remove the plate 5 thus makes it possible to practically and rapidly change the format of the surface portions that can be worked, or, more simply, in the event of breakage or deterioration thereof, to replace it with a spare.

[0042] It is in fact sufficient to apply a moderate traction force upon the handpiece 4 in order to defeat the resistance offered by the hooks 8, and so determine the mutual decoupling between the handpiece 4 and the plate 5, in order to replace such plate with another one that has a differently-shaped anchoring surface 3 (or also with an identical one, if the replacement is due to breakage or deterioration of the first plate).

[0043] As can be seen from the numerous embodiments shown in the accompanying figures, it is possible to provide a plurality of plates 5 with respective anchoring surfaces 3, which can be concave, convex or planar, or which in any case can have different radii of curvature.

[0044] It is also important to note how the presence of the coupling means 6 only on the perimetric regions of the mating areas makes it possible, as can be seen in particular from Figure 2, to have plates 5 that are substantially hollow inside, thus ensuring great effectiveness with regard to aspiration. Such effectiveness is in fact ensured in the first place by the ample empty space which avoids the danger of blockages and which does not require high levels of power for the device for generating vacuum.

[0045] Moreover, unlike what happens with known blocks, the mating between the handpiece 4 and the plate 5 takes place right at the cavity 15 inside the plate 5, thus not requiring any particular care in the alignment between the channels otherwise provided both in the handpiece 4 and in the plate 5.

[0046] Therefore if the specific applicative requirements recommend or impose the removal of dust, then it is sufficient to actuate the device for generating vacuum, which determines the aspiration of the air and of the dust which, passing through the holes 11, runs through the cavity 15 and the channel formed in the handpiece 4, to then be evacuated through the mouth 12.

[0047] The kit according to the invention, particularly indicated for sanding treatments, comprises at least one handpiece 4 that has a grip surface 2 for an operator and a plurality of interchangeable plates 5 (for example there may be five or six, and they may be shaped according to the shapes suggested in the accompanying figures); each plate 5 has a respective anchoring surface 3 for an abrasive surface that is adapted to sanding, the abrasive surface being preferably chosen between an abrasive sheet and an abrasive disk.

[0048] Along perimetric regions of respective mating areas provided on at least one between the handpiece 4 and each one of the plates 5 there are means 6 for mutual and detachable coupling, which make it possible to mate the above mentioned handpiece 4 with any one of the plates 5, each one of which has an anchoring surface 3 with a respective curvature. In this way it is possible to define a block 1 that is adapted to sanding, and the capability to change the plate 5 (by acting on the coupling means 6 for the removal of one of such plates and the mating with another one) makes it possible to vary the curvature presented by the anchoring surface 3, in order to adjust and adapt to the different geometries of the areas that can be treated.

[0049] There is also the possibility of showing, on each plate 5, information on the dimensions and curvature of the respective anchoring surface 3, in order to facilitate identification of the plate 5 that is most suitable by the operator who wants to use the kit according to the invention.

[0050] It thus appears evident how an operator equipped with a kit such as the one just described can effectively and advantageously use it to sand a plurality of different products, by changing the format of the block 1 with a few, simple moves.

[0051] In practice it has been found that the block according to the invention fully achieves the intended aim, since the choice to use means for mutual coupling between the handpiece that has the grip surface for the operator and the interchangeable plate that has the anchoring surface for the abrasive sheet (or disk), such means being distributed on a substantially perimetric region of respective mating areas provided on the handpiece and/or on the plate, ensures a high level of reliability in operation over time and even after prolonged use.

[0052] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0053] In the embodiments illustrated, individual characteristics shown in relation to specific examples may in reality be interchanged with other, different characteristics, existing in other embodiments.

[0054] In addition, it should be noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subj ect of a disclaimer.

[0055] In practice the materials employed, as well as the dimensions, may be any according to requirements and to the state of the art.

[0056] The disclosures in Italian Patent Application No. BO2009A000534 from which this application claims priority are incorporated herein by reference.

[0057] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of exam-

ple by such reference signs.

Claims

1. A block, particularly for sanding treatments, comprising at least one grip surface (2) for an operator and at least one anchoring surface (3) for an abrasive surface adapted for sanding, said abrasive surface being chosen preferably between an abrasive sheet and an abrasive disk, **characterized in that** it is constituted substantially by at least one handpiece (4), which is provided with said grip surface (2), at least one interchangeable plate (5), which is provided with said anchoring surface (3), and means (6) for the mutual and detachable coupling of said handpiece (4) and of said plate (5), said coupling means (6) being distributed on a substantially perimetric region of respective mating areas provided on at least one between said handpiece (4) and said plate (5).

2. The block according to claim 1, **characterized in that** said plate (5) is constituted substantially by said anchoring surface (3), which has a curvature that is adapted for sanding specific products, and by a frame (7), which is substantially perpendicular to the perimeter of said anchoring surface (3), the free top (7a) of said frame (7) defining said perimetric region affected by said coupling means (6).

3. The block according to claims 1 and 2, **characterized in that** said coupling means (6) comprise at least two hooks (8), which are arranged along said free top (7a) of said frame (7) and can engage elastically against respective abutments formed along said corresponding mating area of said handpiece (4), which is arranged on the opposite side with respect to said grip surface (2).

4. The block according to one or more of the preceding claims, **characterized in that** said handpiece (4) is constituted by a secondary block (10) that has a substantially box-like shape, said secondary block (10) having a first face that is shaped ergonomically so as to define said grip surface (2) and having a second substantially flat face, on the opposite side with respect to said grip surface (2), which forms said mating area of said handpiece (4).

5. The block according to claim 1, **characterized in that** it comprises a circuit for aspirating the dust produced during sanding, in order to allow its automatic evacuation.

6. The block according to claim 5, **characterized in that** said suction circuit comprises a channel formed along said handpiece (4) and a plurality of holes (11) formed along said anchoring surface (3), said channel leading to a mouth (12) that can be associated with a device for generating vacuum.

7. The block according to one or more of the preceding claims, **characterized in that** the abrasive surfaces that can be associated with said anchoring surface (3) have a plurality of through openings, said plurality of holes (11) and said plurality of openings constituting a network of channels for the passage of the dust as a consequence of suction.

8. The block according to one or more of the preceding claims, **characterized in that** said anchoring surface (3) is provided with strips of VELCRO®, which can be mated with similar bands arranged on the abrasive sheets and on the abrasive disks.

9. A kit, particularly for sanding, **characterized in that** it comprises at least one handpiece (4), which has a grip surface (2) for an operator and a plurality of interchangeable plates (5) which have respective anchoring surfaces (3) for an abrasive surface that is adapted for sanding, said abrasive surface being chosen preferably between an abrasive sheet and an abrasive disk, along perimetric regions of respective mating areas provided on at least one between said handpiece (4) and each one of said plates (5) there being means (6) for mutual and detachable coupling, for mutual mating adapted to form a block (1) adapted for sanding, each anchoring surface (3) of each one of said plates (5) having different curvatures in accordance with the different geometries of the areas that can be treated.

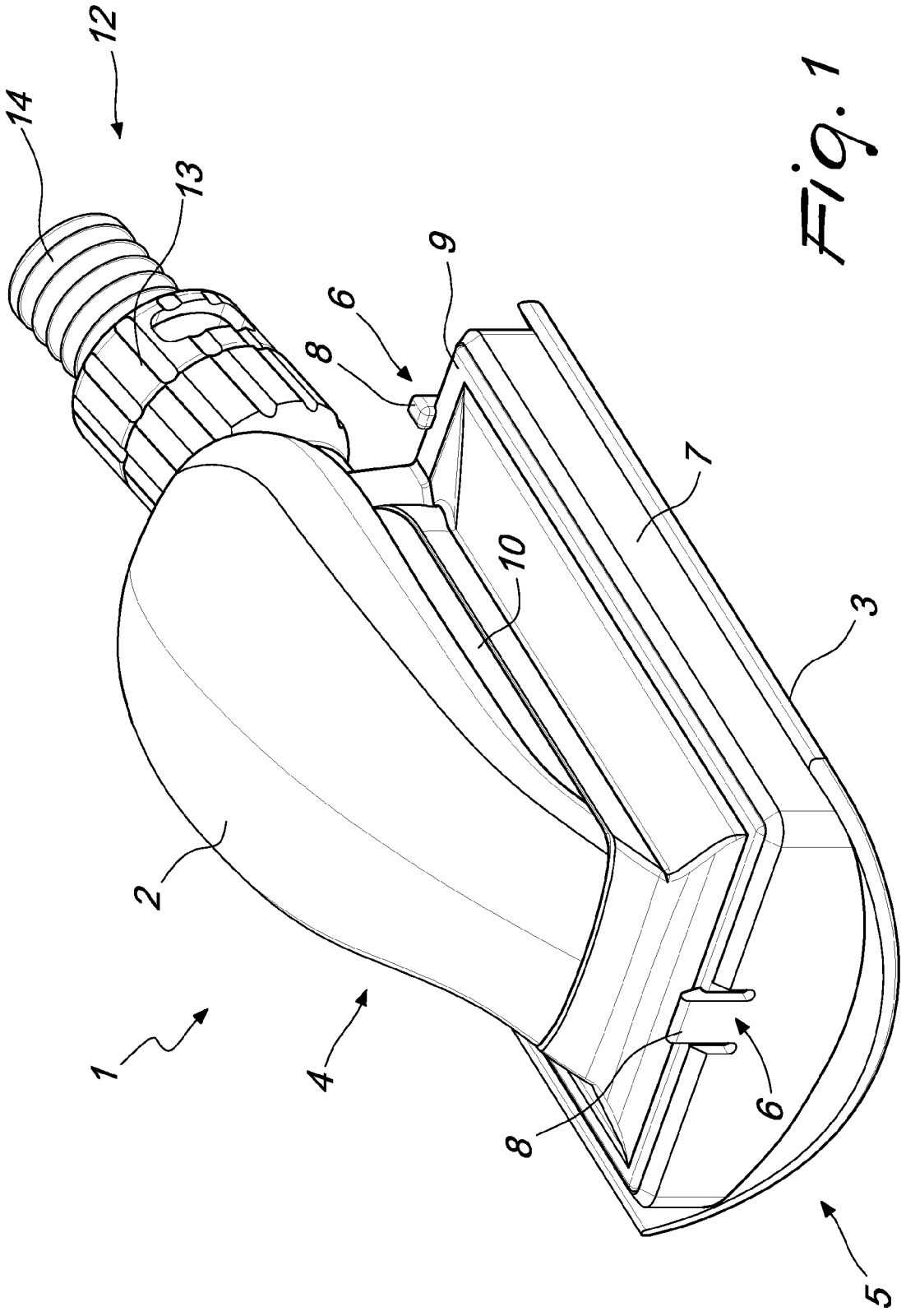


Fig. 1

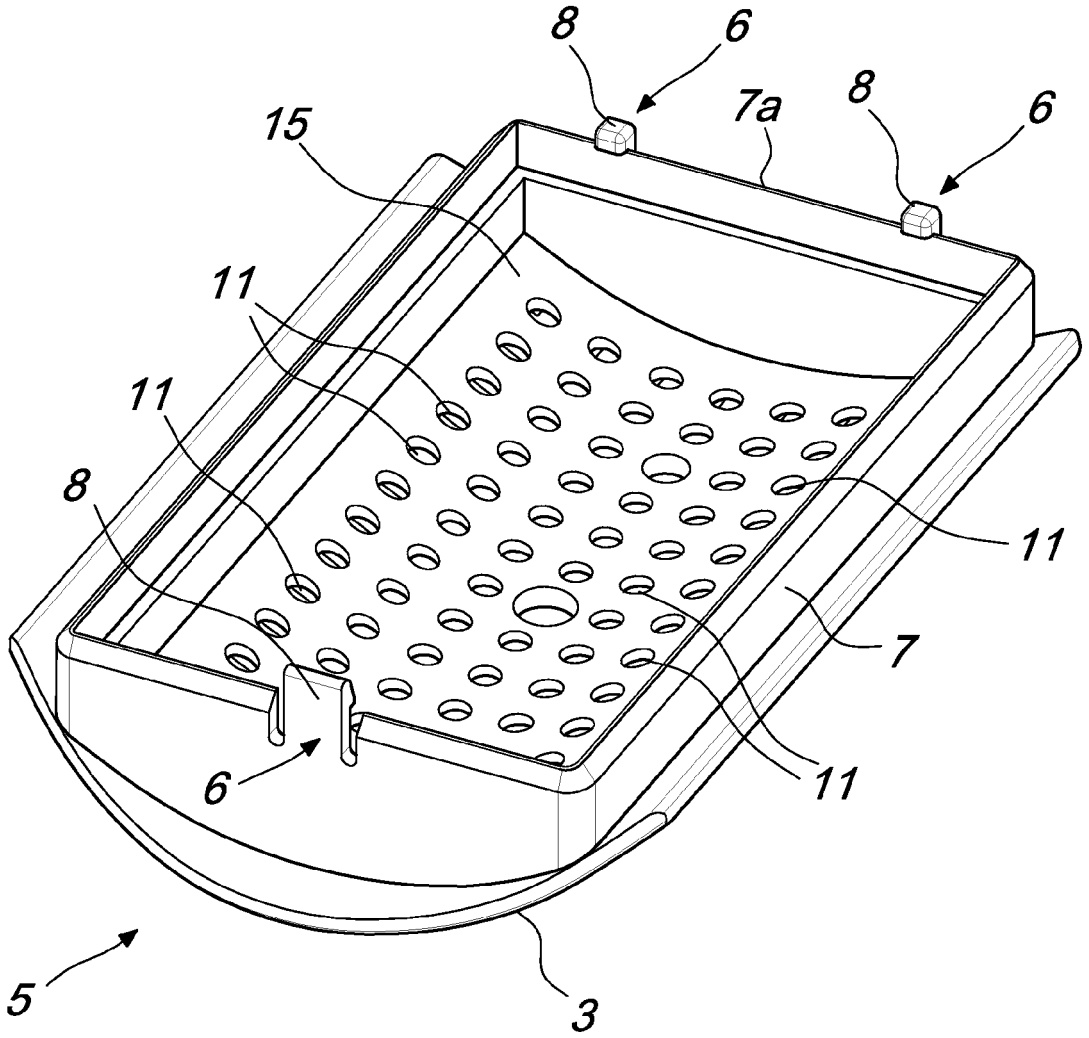


Fig. 2

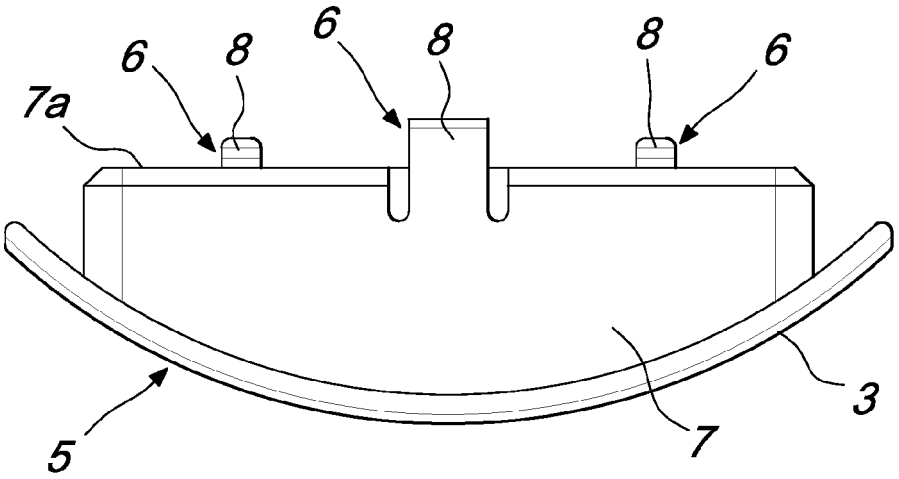


Fig. 3

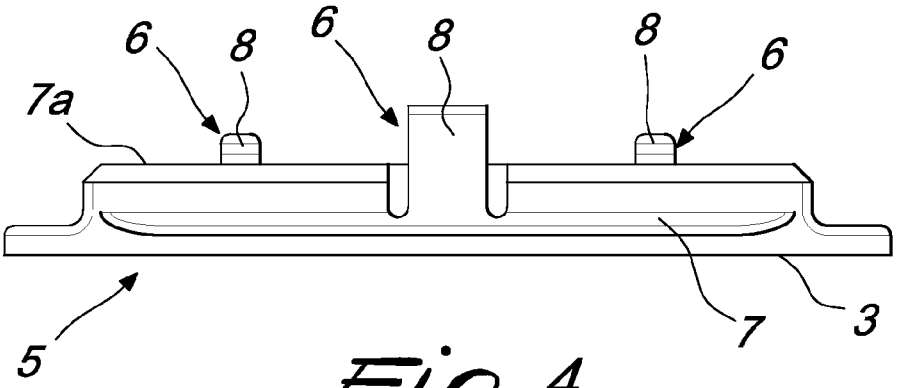


Fig. 4

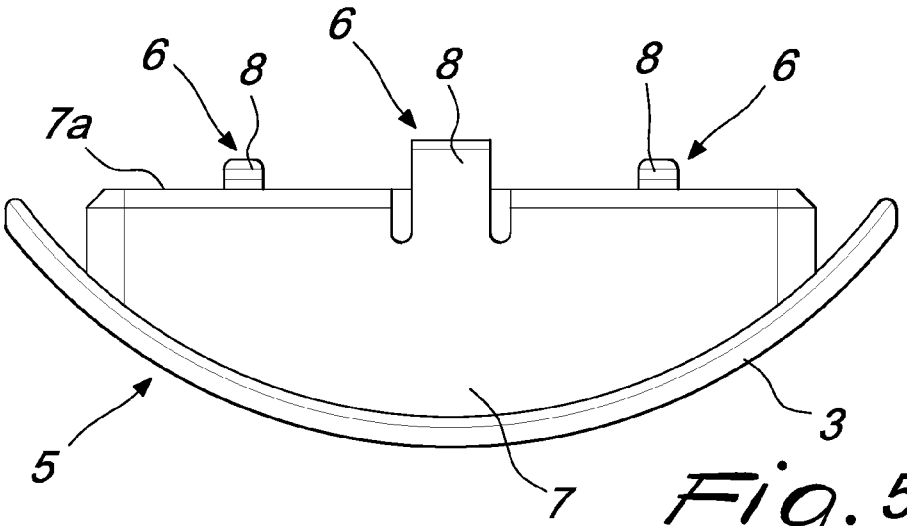


Fig. 5

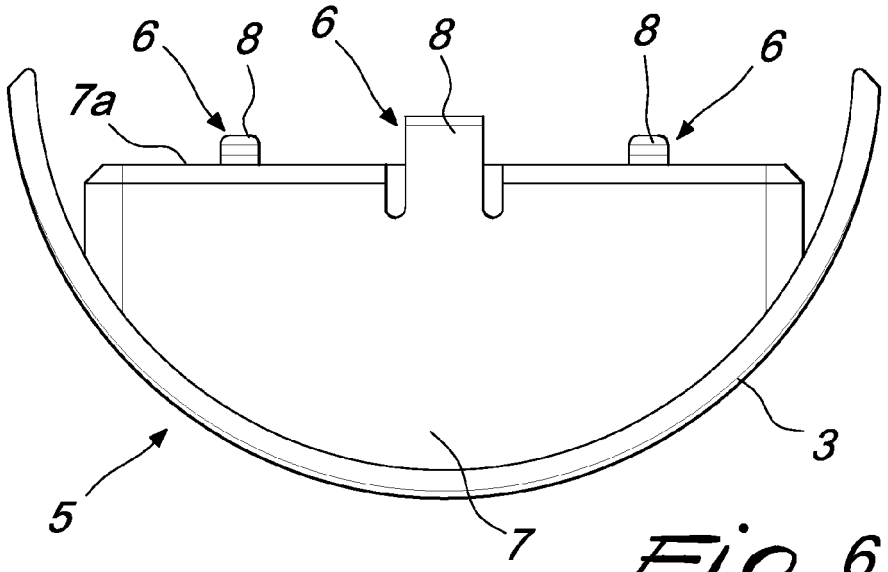


Fig. 6

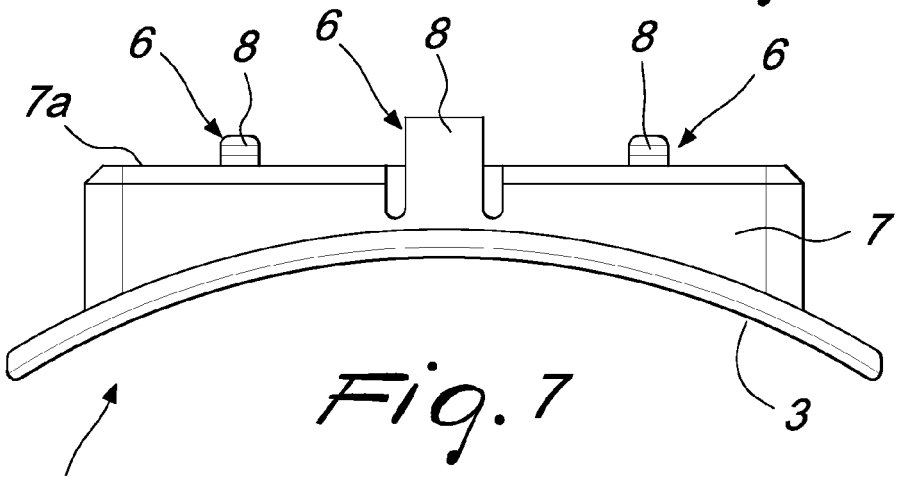


Fig. 7

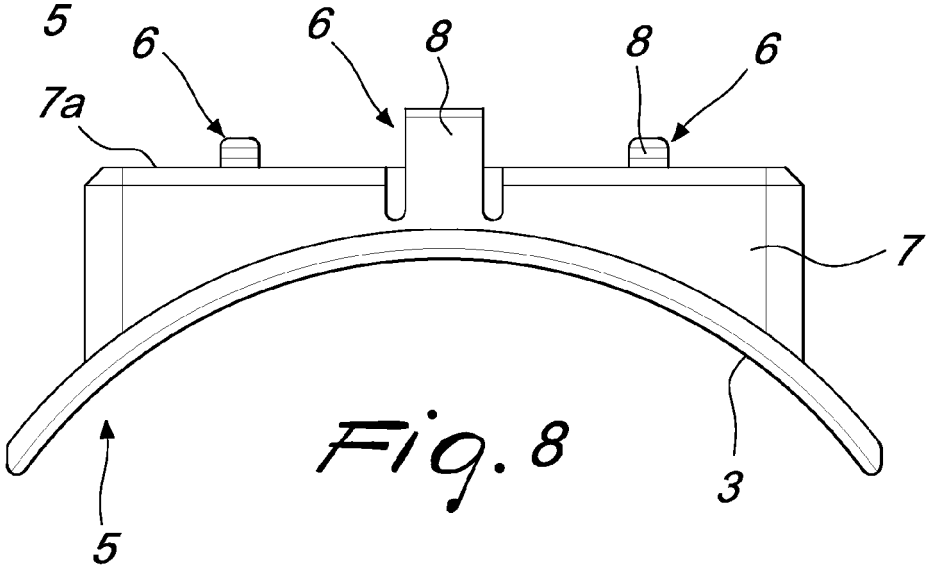


Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 10 17 0947

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 Y	US 2 546 245 A (WEIGEL JOHN G) 27 March 1951 (1951-03-27) * column 1, line 42 - column 3, line 25; figures *	1-3,9 5-8	INV. B24B55/10 B24D15/02
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Y	US 5 634 843 A (LIU TE-HSI [TW]) 3 June 1997 (1997-06-03) * figures 2-5 *	5-8	
			TECHNICAL FIELDS SEARCHED (IPC) B24B B24D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	14 October 2010	Gelder, Klaus

CATEGORY OF CITED DOCUMENTS

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14-10-2010

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US 4221084 A	09-09-1980	NONE	
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