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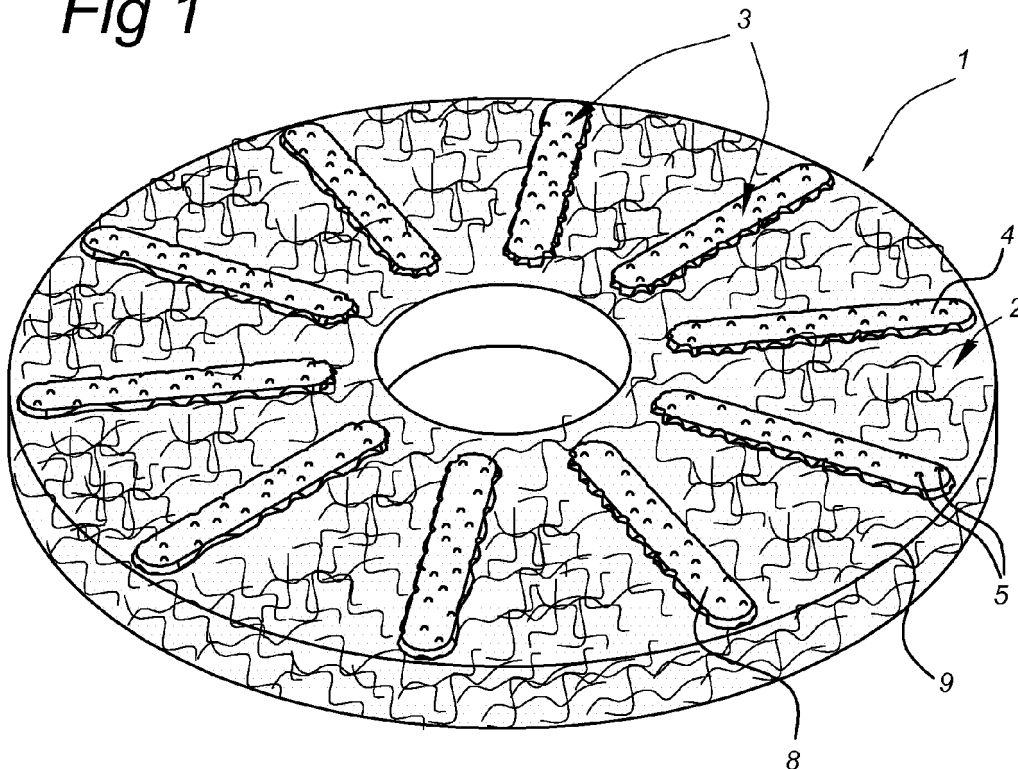
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(54) **Floor treatment device and method for manufacturing same**

(57) A floor treatment device comprises a pad (1) of an open lofty non-woven material as well as a plurality of segments (3) spaced from one another and consisting of a plastic material (4) and abrasive particles (7, 8), such as diamond particles. The segments are adhered to a

surface (2) of the pad (1). The floor treatment device is characterized by bodies (5) which are embedded in the plastic material (4) of the segments (3), said bodies (5) comprising a matrix material (6) as well as abrasive particles (7) contained in said matrix material.

Fig 1



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Description

Field of the invention

[0001] The invention is related to a floor treatment device, comprising a flexible pad, e.g. of an open lofty non-woven material, as well as segments spaced from one another and consisting of a plastic material and abrasive particles, said segments being adhered to a surface of the pad.

[0002] Such a floor treatment device is generally known. It is obtained by pouring a mixture of a flowable plastic material and abrasive particles dispersed therein onto the surface of the pad. The surface in question is covered by a mask with a specific pattern of openings, in such a way that the flowable plastic material adheres only to the pad at the location of the openings in the mask. The flowable plastic material is subsequently hardened.

[0003] The floor treatment device may be applied for several purposes, such as polishing, cleaning, buffing, sanding or grinding floors. The floors to be treated may consist of several materials, such as stone, wood or polymer materials. In particular, the floors may consist of marble, granite terrazzo and the like. Depending on the kind of treatment to be carried out, the flexible pad may consist of several materials, e.g. plastic fiber materials, felt material, non woven material or steel fibers. Also, several type of abrasive particles may be applied, such as diamond, cubic boron nitride (CBN) etc.

[0004] The floor treatment device is usually mounted on the rotary head of a floor treatment machine. By rotating the floor treatment device in contact with the floor surface, the desired treatment of the floor is carried out while advancing the floor treatment machine over the surface. In this way, the floor may be cleaned, polished, ground and the like. Furthermore, it is possible to carry out a crystallization operation, by subjecting e.g. a marble floor surface to the rotary action of the floor treatment device in the presence of a crystallization liquid.

[0005] During these processes, the abrasive particles as contained in the segments exert a cleaning, polishing or grinding effect on the floor surface. This effect will be maintained as long as the abrasive particles are not worn down or have come loose from the segments which are arranged on the pad. As soon as the treatment effect has been diminished to such an extent that the desired effect can no longer be obtained, the floor treatment device is discarded and replaced by a fresh one.

Summary of the invention

[0006] The object of the invention is to provide a floor treatment device of the above type which has an improved effect and an extended service life. This object is achieved by applying bodies which are embedded in the plastic material of segments, said bodies comprising a matrix material as well as abrasive particles contained in said matrix material.

[0007] In the floor treatment device according to the invention, the abrasive particles are now concentrated in the bodies, which can be manufactured beforehand under precisely controlled conditions. For instance, the bodies can be obtained by pressing a mixture of plastic material and abrasive particles in specially designed molds. Thus, the abrasive particles can be held in a reliable way in the plastic material of the bodies.

[0008] Preferably, the bodies emanate at a free surface of segments. Thereby, the abrasive particles in the bodies are able to exert the required treatment of the floor directly from the start of the operation. Furthermore, in order to obtain a uniform treatment of the floor, the bodies may be spread in a regular fashion throughout the plastic material of the segments. The bodies may have several shapes; preference is given to bodies with a globular shape. The size of the bodies is at least an order of magnitude smaller than the size of the segments. For instance, the size of the bodies may be in the range of 1-5 mm. As an example, a number of 10-100 bodies may be contained in a single segment. The bodies may comprise a resin matrix material.

[0009] As highlighted before, the abrasive particles are contained in the bodies which are embedded in the segments. Additionally, the segments themselves may contain abrasive particles outside the area occupied by the bodies. Thus, both the abrasive particles of the bodies contained in the segments as well as the abrasive particles applied on or in the segments contribute to the treatment effect.

[0010] The segments preferably comprise a resin material. This resin material may be mixed with a hardening agent, such that after pouring the resin material onto the pad, the hardening phase will commence. Suitable hardening agents comprise phenols. Alternatively, thermo hardening resins may be applied which will harden under the influence of heat. In addition to the abrasive particles as contained in the bodies and segments, the pad may comprise abrasive particles as well. In this connection, a mixture of a liquid bonding material and abrasive particles may be sprayed onto the surface of the pad.

[0011] The invention is also related to a process for manufacturing a floor treatment device as described before, comprising the steps of:

- providing a flexible pad, e.g. of an open lofty non-woven material,
- providing a flowable plastic material,
- providing bodies comprising a matrix material as well as abrasive particles contained in said matrix material,
- pouring the flowable plastic material on the pad while allowing the flowable plastic material to penetrate into the voids of the open material of the pad,
- applying the bodies on and/or in the still flowable plastic material,
- curing the flowable plastic material.

[0012] A desired pattern of spaced apart segments may be obtained by applying a suitable designed mask onto the surface in question, and by subsequently pouring the mixture over said mask. The mixture will adhere to the pad at the position of the openings in the mask only, thus providing the desired pattern.

[0013] Furthermore, the process may comprise the steps of:

- providing a mixture of a flowable plastic material containing bodies comprising a matrix material as well as abrasive particles contained in said matrix material,
- pouring the mixture on the pad while allowing the flowable plastic material to penetrate into the voids of the open lofty non-woven material of the pad,
- curing the flowable plastic material.

Description of an embodiment of the invention

[0014] The invention will now be described further with reference to an embodiment shown in the drawings.

Figure 1 shows the floor treatment device in perspective.

Figure 2 shows the floor treatment device in perspective at a slight angle.

Figure 3 shows the floor treatment device in perspective and in cross section.

Figure 4 shows a cross section through a body or globule.

[0015] The floor treatment device as shown in figures 1-3 consists of a flexible pad 1 and a number of abrasive segments 3 which are regularly distributed over a surface 2 of the pad. The pad 1 may have several structures. For instance, the pad 1 may consist of a non-woven open lofty fiber material. Such material consist of a multitude of randomly intertwined fibers between which openings and pores and the like are left over. Alternatively, it is possible to apply a felt material.

[0016] The segments 3 consist of a plastic material 4 and haven been applied on a surface 2 of the pad by pouring. The surface 2 is covered by means of a mask having a pattern of openings corresponding to the segments to be obtained. Upon pouring, the plastic material penetrates into the openings and pores which emanate at the surface of the pad. Thus, after hardening the plastic material, the segments firmly adhere to the open material of the pad.

[0017] According to the invention, bodies or globules 5 are embedded in the plastic material of the segments. As shown in the cross section of figure 4, these bodies 5 consist of a plastic material 6 as well a multitude of abrasive particles 7 dispersed through said plastic material. The bodies 5 have been manufactured beforehand under controlled conditions, and may be mixed throughout the plastic material of the segments before this is

poured as a mixture onto the pad. Thus, the bodies 5 will be distributed throughout the segments 3.

[0018] In addition to the abrasive particles in the bodies 5, further abrasive particles may be distributed throughout the segments 3 outside the area occupied by the bodies 5. Thus, both the abrasive particles 7 as contained in the globules 5, as well as the abrasive particles 8 as contained in the segments 3 outside the globules 5 will then attribute to the abrasive effect of the floor treatment device. Further, abrasive particles 9 may be adhered in a known way to the material of the pad 1 as well, outside the areas occupied by the segments. In such embodiment, the abrasive effect of the floor treatment device is obtained by three different kinds of abrasive particles, that is the particles 7 as contained in the bodies 5, the particles 7 as contained in the segments outside the bodies 5 and the particles 9 attached to the pad 1 outside the segments 3.

Claims

1. Floor treatment device, comprising a pad (1) of an open lofty non-woven material as well as a plurality of segments (3) spaced from one another and consisting of a plastic material (4) and abrasive particles (7, 8), such as diamond particles, said segments being adhered to a surface (2) of the pad (1), **characterized by** bodies (5) which are embedded in the plastic material (4) of the segments (3), said bodies (5) comprising a matrix material (6) as well as abrasive particles (7) contained in said matrix material.
2. Floor treatment device according to claim 1, wherein bodies (5) emanate at a free surface of segments (3).
3. Floor treatment device according to claim 1 or 2, wherein the bodies (5) are spread throughout the plastic material (4) of the segments (5).
4. Floor treatment device according to any of the preceding claims, wherein the bodies (5) are of a globular shape.
5. Floor treatment device according to any of the preceding claims, wherein the size of the bodies (5) is at least an order of magnitude smaller than the size of the segments (3).
6. Floor treatment device according to any if the preceding claims, wherein the size of the bodies (5) is 1-5 mm.
7. Floor treatment device according to any of the preceding claims, wherein a number of 10-100 bodies (5) is contained in a segment (3).
8. Floor treatment device according to any of the pre-

ceding claims, wherein the bodies (5) comprise a resin matrix material.

9. Floor treatment device according to any of the preceding claims, wherein the segments (3) contain abrasive particles (8) outside the area thereof which is occupied by the bodies (5). 5
10. Floor treatment device according to any of the preceding claims, wherein the segments (3) comprise a resin material. 10
11. Process for manufacturing a floor treatment device according to any of the preceding claims, comprising the steps of: 15
 - providing a pad of an open lofty non-woven material,
 - providing a flowable plastic material,
 - providing bodies comprising a matrix material as well as abrasive particles contained in said matrix material, 20
 - pouring the flowable plastic material on the pad while allowing the flowable plastic material to penetrate into the voids of the open lofty non-woven material of the pad, 25
 - applying the bodies on and/or in the still flowable plastic material,
 - curing the flowable plastic material. 30
12. Process according to claim 11, comprising the steps of:
 - providing a mixture of a flowable plastic material containing bodies comprising a matrix material as well as abrasive particles contained in said matrix material, 35
 - pouring the mixture on the pad while allowing the flowable plastic material to penetrate into the voids of the open lofty non-woven material of the pad, 40
 - curing the flowable plastic material.
13. Process according to claim 11 or 12, comprising the step of pouring the mixture onto a surface of the pad according to multiple members while maintaining free surface parts between the members. 45
14. Process according to any of claims 11-13, comprising the steps of: 50
 - providing a plastic material containing a harder,
 - curing the plastic material under the influence of the harder. 55

Fig 1

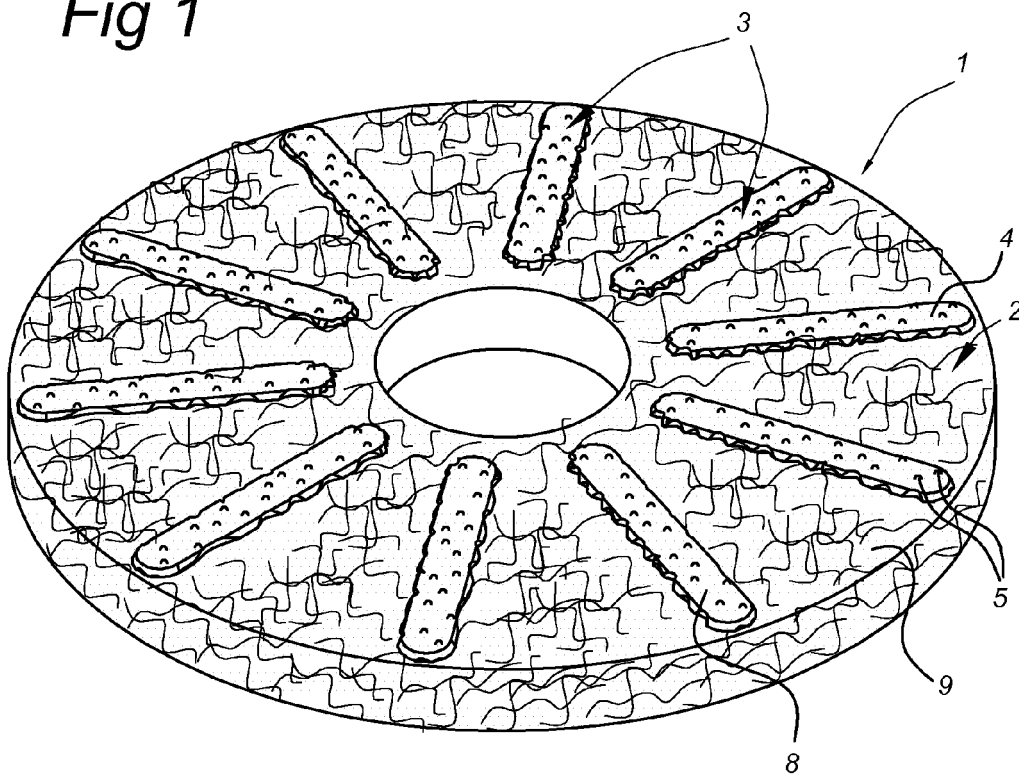


Fig 2

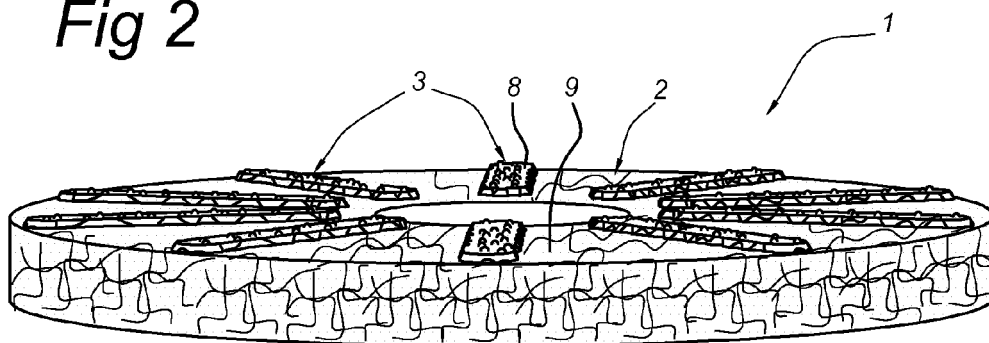


Fig 3

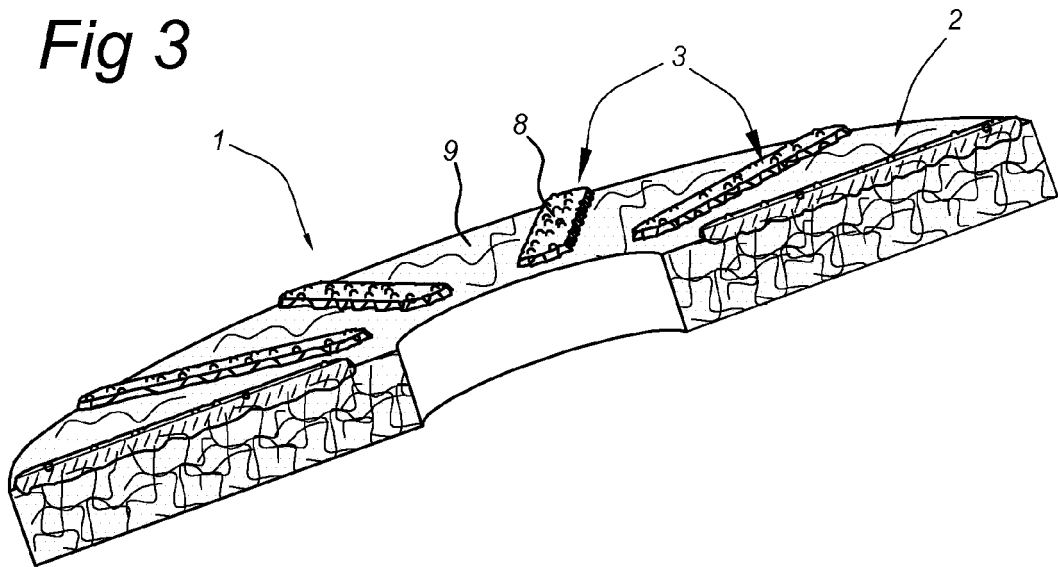


Fig 4

