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(54) Cleaning means for cleaning the bottom of a boat

(57) Cleaning means (1) for cleaning the bottom of a boat, which cleaning means (1) can be fitted into a mooring location for a boat, such as e.g. a mooring berth (4), and which cleaning means (1) comprises one or more mat-type pieces (2), floating in the water, that can be

directly or indirectly fastened to a mooring location, on top of which piece/pieces a boat can be driven for keeping the bottom of the boat clean. The mat-type piece (2) comprises segments (10, 10', 10'') that can be detached from each other.

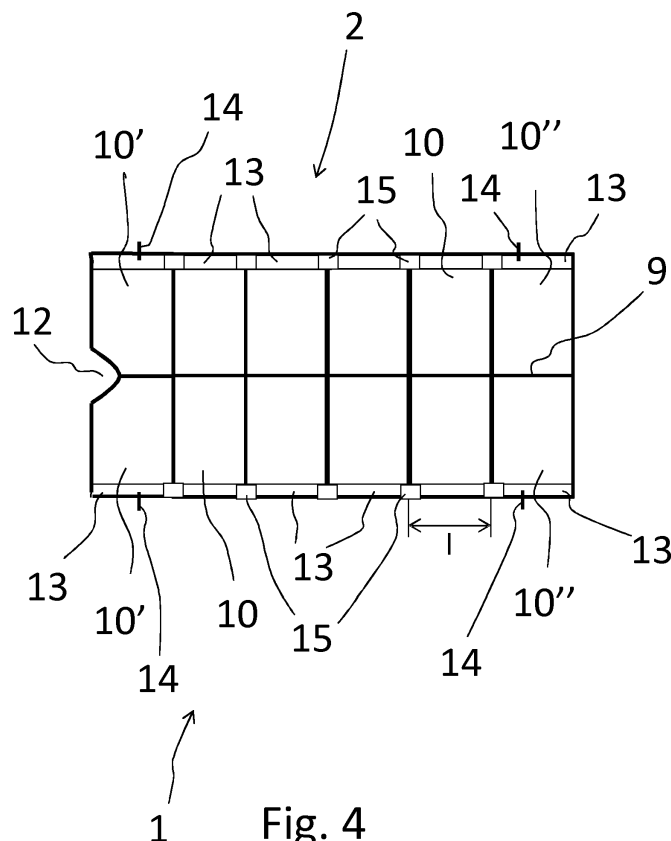


Fig. 4

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Description

Background of the invention

[0001] The object of the invention is a cleaning means for cleaning the bottom of a boat.

[0002] Many boats are typically used a few tens of hours or a few hundred hours per year and the rest of the time the boat stays at its mooring location, i.e. usually in a berth or anchored. The bottom of the boat fouls and algae and other growth forms on the bottom when the boat stays still in the water (in a berth). Fouling and growth affect the maneuverability and performance of a boat and can increase fuel consumption of the boat by 30% or even more.

Prior art

[0003] Generally boat bottoms are painted with so-called antifouling paints, i.e., bottom paints that are toxic, (or with other products for preventing the attachment of fouling/algae).

[0004] The efficacy of these paints or corresponding products has diminished appreciably because current environmental directives regulate the environmentally harmful substances to be used in paints. For this reason antifouling paints do not effectively prevent the fouling of the bottom of a boat. In addition, painting the bottom of a boat with antifouling paints is laborious and time-consuming.

[0005] One prior-art solution is a brush washer intended for washing the bottom of boats, said washer being fitted to a berth or corresponding, such as those e.g. at boat servicing facilities. A brush washer comprises one or more brushes, onto which a boat is driven, and the brushes wash the bottom clean of fouling, such as barnacles, algae, *et cetera*. However, brush washers are not in use in very many locations and, furthermore, if a boat stays for a longer time in a berth, *et cetera*, fouling will collect on its bottom, i.e. this would require using a brush washer a number of times during the boating season if it is desired to keep the bottom of the boat clean for the whole of the boating season.

[0006] Also known in the art are tarpaulin-type (plastic covering, *et cetera*) devices that are placed under a boat and they prevent the fouling starting by preventing the supply of light needed for fouling or otherwise in some solutions tarpaulins form a pool in which the nutrition needed for fouling does not change/is not able to contact the boat or otherwise known in the art are tarpaulins by means of which a pool is formed around a boat, which pool is filled with fresh water that in turn prevents fouling and corrosion.

[0007] These prior-art solutions are, however, awkward to achieve and use.

[0008] The purpose of this invention is to achieve a new type of cleaning means for cleaning the bottom of a boat (i.e. for keeping the bottom of the boat clean), with

which it is possible to avoid the drawbacks of prior art that are described above.

Brief description of the invention

[0009] The cleaning means according to the invention is characterized by what is stated in the characterization part of claim 1. The solution according to the invention now being presented has some significant advantages compared to prior-art solutions.

[0010] With the invention now presented a new type of cleaning means for cleaning the bottom of a boat is achieved, with which the bottom of the boat stays clean when the boat is in a berth, and the cleaning means according to the invention is suited to many different boats. The solution according to the invention is also relatively simple and inexpensive to manufacture and fits into various berths.

[0011] With the solution according to the invention a cleaning means that functions actively is achieved, which without a separate procedure cleans the bottom of a boat always when the boat is moored to a mooring location, such as a berth. The mat-type piece of the cleaning means is able to move against the bottom of the boat causing friction between the bottom of the boat and the mat-type piece when the bottom of the boat is in contact with the mat-type piece, in which case the mat-type piece is arranged to clean the bottom of the boat. Owing to the segmentalized structure the cleaning means is easily portable and transportable from one location to another when the segments are detached from each other. The segments are fastened to each other at, or in the vicinity of, a mooring location of the boat. In addition, the cleaning means according to the invention is easily convertible to be suitable for different-sized boats by changing the number of segments in the length and/or width direction of the boat.

Brief description of the figures

[0012] In the following, the invention will be described in more detail by the aid of examples with reference to the drawings 1 -3, wherein

Fig. 1 presents a perspective sketch of a cleaning means according to the invention fitted into a berth,

Fig. 2 presents a side view of the structure of the cleaning means,

Fig. 3 presents a top view of a cleaning means according to one embodiment of the invention, and

Fig. 4 presents an arrangement with which the segments of the mat-type piece according to Fig. 3 can be fastened to each other.

Detailed description of the invention

[0013] According to Figs. 1-3 the cleaning means 1, according to the invention, for cleaning the bottom of a boat is fitted into a mooring location for a boat, such as e.g. a mooring berth 4, and the cleaning means 1 comprises one or more mat-type pieces 2, floating in the water, on top of which piece/pieces a boat can be driven for keeping the bottom of the boat clean when it is in contact with the mat-type piece 2. The mat-type piece 2 is able to move against the bottom of the boat, or in relation to the bottom of the boat, when the boat is above the mat-type piece, cleaning the bottom of the boat (friction occurs between the mat-type piece and the bottom of the boat), i.e. the wind and currents move the boat above the mat-type piece and in this case the bottom of the boat rubs against the mat-type piece and the bottom is cleaned of fouling, such as such as barnacles, algae, *et cetera*.

[0014] When using the cleaning means, the boat is driven on top of the mat-type piece and moored normally with ropes to the berth 4. Correspondingly, when driving the boat away from the berth, the ropes of the boat are detached from the berth and the boat is reversed out. The bottom of the boat rubs against the mat-type piece and is thus cleaned when the boat is driven on top of the mat-type piece and away from being on top of the mat-type piece.

[0015] According to Fig. 1 the mat-type piece 2 is fastened with fastening means 5, e.g. with fixing ropes and/or wires and/or fixing bars or chains to the berth 4, to the fixing means 7 on the floats 6 of the berth, such as to fixing shackles or corresponding. The fixing means can be fitted to the berth/mat-type piece in the desired manner, e.g. at a corner.

[0016] A support mat 3 of a material that floats in water can also be fastened to the mat-type piece 2, or arranged under it, for floating and/or supporting the mat-type piece.

[0017] A fold 9 in the mat-type piece 2 is presented in Fig. 1 with the reference number 9, i.e. a folded point can be in the center of said piece, because most boats have so-called V-shaped hulls, and in this case it is easy to drive the boat onto the mat-type piece at the point of the fold.

[0018] A support structure (e.g. a wooden support frame) can also be fastened to the underside/to the sides of the mat-type piece 2 for supporting the mat-type piece, but this is not presented in Figs. 1-2. The segmented structure of the mat-type piece 2 is also not apparent in Figs. 1 and 2, but instead this is described in more detail in Fig. 3.

[0019] The mat-type piece 2 can be a plastic mat, a rubber mat or a mat of fiber material, or a combination of these. The mat-type piece 2 can also be e.g. a mat comprising bristles, i.e. a so-called bristle mat, and in this case it cleans the bottom of the boat extremely effectively when the boat moves on the mat. The support mat 3 can be foamed plastic, cellular plastic or any other floating material suited to the purpose.

[0020] Fig. 3 describes the segmentalized structure of the mat-type piece 2 in more detail. The mat-type piece 2 comprises segments 10, 10', 10" fastened to each other. The segments 10, 10', 10" can be detached from each other. The segments 10, 10', 10" are fastened to each other when the mat-type piece 2 has been fixed to the berth. The segments 10, 10', 10" can be detached from each other for facilitating the transfer and/or transportation of the mat-type piece 2. In addition, by adding or removing segments the mat-type piece 2 can be converted to be suitable for boats of different sizes. Typically there are 1-3 segments 10, 10', 10" in the width direction of the boat. In the embodiment of Fig. 3 there are two segments 10, 10', 10" in the width direction of the boat. Correspondingly, there are e.g. 2 or 3-8 segments 10, 10', 10" in the longitudinal direction of the boat, depending on the length of the boat. In the embodiment of Fig. 3 there are six segments 10, 10', 10" in the longitudinal direction of the boat. As viewed from above, the segments 10, 10', 10" are rectangular or square in shape.

[0021] The length (l) of a segment 10, 10', 10", i.e. the dimension in the longitudinal direction of the boat, is typically 500-1300 mm. A cutting 12 of the desired shape for the rigging of the motor of the boat can be made in the rear segments 10' at the end of the mat-type piece 2. The front ends of the front segments 10" at the other end of the mat-type piece 2 can be shaped in the manner desired, e.g. to be curved or beveled. The support mat 3 under the mat-type piece 2 can be formed from segments in a manner corresponding to that of the mat-type piece 2. The support mat 3 can be fixed to the segments 10, 10', 10" with screws. The support mat 3 is the same size or roughly the same size as the segment to which the support mat 3 is fixed.

[0022] Fixing means, such as fixing battens 11, are fixed to the edges of the rear segments 10', by means of which fixing means the mat-type piece 2 can be fixed to the berth or buoy with fastening means 5. If necessary, a fixing batten 11 can also be fixed to the segments 10 in front of the rear segments 10' (as in Fig. 3), in which case the fixing point of the rear end of the mat-type piece 2 can be optimized. On the front segments 10" are fastening rings, with which the front end of the mat-type piece 2 can be fastened to the berth.

[0023] The segments 10, 10', 10" can be fixed to each other e.g. with support pieces, which are fixed to the mat-type piece 2 with bolts and nuts. Alternatively, mat-type pieces 2 can be fastened to each other by tying with rope or with fixing battens.

[0024] Fig. 4 presents a second arrangement, with which the segments 10, 10', 10" of the mat-type piece 2 of Fig. 3 can be detachably fastened to each other. In this embodiment each segment 10, 10', 10" is provided with its own support member 13, such as with an aluminium profile or profiled sheet. The support member 13 is fixed to one end, i.e. the outer end, of a segment 10, 10', 10". The support member 13 can extend for the whole length (l) of the end of the segment. The support member

13 is fixed to the segment 10, 10', 10" with suitable fastening means, e.g. with bolts and nuts. Also a support mat 3 can be fixed to a segment 10, 10', 10" by means of a support member 13. The support mat 3 is fixed to the bottom surface of each segment 10, 10', 10". The support member 13 can comprise a fixing ring 14 for fixing the mat-type piece 2 with a rope to the berth or to some other boat mooring location.

[0025] Adjacent segments 10, 10', 10" are fastened to each other with a coupling part 15, which is fastened to the support members 13 of segments next to each other with fastening means suited for the purpose, e.g. with bolts and nuts. The coupling part 15 can be plate-shaped or U-shaped, e.g. aluminium profile or profiled sheet.

[0026] In the center of a mat-type piece 2 is a fold 9 at the point of connection of the segments 10, 10', 10". The ends of segments facing each other are bent downwards and fixed to each other, in which case a fold 9 forms between the segments. The ends of segments 10, 10', 10" facing each other are connected to each other with joint pieces, e.g. with U-shaped aluminium profile or profiled sheet, inside which the ends of the segments facing each other are fitted. The joint piece is fastened to the ends of segments facing each other with fixing means suited to the purpose, e.g. with bolts and nuts. Also the support mats 3 of segments are fastened to the segments 10, 10', 10" by means of a joint piece. In addition, at the point of the fold 9 the segments 10, 10', 10" next to each other are fixed to each other with a joint part, which is fixed onto the joint pieces of the segments that are next to each other, e.g. with bolts and nuts. The joint part can be U-shaped, e.g. aluminium profile or profiled sheet.

[0027] An individual segment, e.g. a front segment 10", can be detached from the segmentalized piece 2 by detaching the coupling part 15 from the support member 13 of the segment 10" in question. In addition, the joint part fastened to the joint piece on the fold 9 side of the end of the segment 10" in question is detached and the end of the segment 10" in question is detached from the joint piece. Fastening a segment to the segmentalized piece 2 is performed in the reverse sequence.

[0028] It is obvious to the person skilled in the art that the different embodiments of the invention are not either limited solely to the examples described above, and that they may for these reasons be varied within the scope of the claims presented below.

[0029] The material of the mat-type piece can be what is desired, i.e. the mat can be of any material whatsoever that is suitable for cleaning the bottom of a boat, preferably plastic material, rubber material. Also the surface of the mat-type piece can be of the type desired, it can be flat, or it can have patterning, bristles, *et cetera*.

[0030] In the solution according to the invention also possible is a type of embodiment wherein the mat-type piece is fastened directly to the berth without ropes or the like.

[0031] In the solution according to the invention the dimensional relationships of the berth and mat-type piece

are in no way restricted, but instead they can be freely selected according to each application, i.e. according to the size and shape of the boat and of the berth.

[0032] In the solution according to the invention the mooring location can be a mooring point comprising anchorings or poles, i.e. in this case the mat-type piece is fixed e.g. to these anchorings or poles and the boat is driven in the same way on top of the mat-type piece as if the mat-type piece were in a berth. In the solution according to the invention a boat does not therefore necessarily have to be in a berth, but instead it can be farther from land, e.g. at sea (or on a lake).

Claims

1. Cleaning means (1) for cleaning the bottom of a boat, which cleaning means (1) can be fitted into a mooring location for a boat, such as e.g. a mooring berth (4), and which cleaning means (1) comprises one or more mat-type pieces (2), floating in the water, that can be directly or indirectly fastened to a mooring location, on top of which piece/pieces a boat can be driven for keeping the bottom of the boat clean, **characterized in that** the mat-type piece (2) comprises segments (10, 10', 10") that can be detached from each other.
2. Cleaning means, according to claim 1, for cleaning the bottom of a boat, **characterized in that** there are 1-3 segments (10, 10', 10") in the width direction.
3. Cleaning means (1), according to claim 1 or 2, for cleaning the bottom of a boat, **characterized in that** there are 3-8 segments (10, 10', 10") in the longitudinal direction.
4. Cleaning means (1), according to any of the preceding claims, for cleaning the bottom of a boat, **characterized in that** the mat-type piece (2) is a mat comprising bristles, i.e. a so-called bristle mat.
5. Cleaning means (1), according to any of the preceding claims, for cleaning the bottom of a boat, **characterized in that** a support mat (3) of a floating material is fastened to the bottom surface of the segments (10, 10', 10") for floating and/or supporting the mat-type piece (2).
6. Cleaning means (1) according to any of the preceding claims, **characterized in that** a separate support member (13) is fixed to the end of each segment (10, 10', 10"), and the support members (13) of segments (10, 10', 10") next to other are connected to each other with a coupling part (15).
7. Cleaning means (1) according to claim 6, **characterized in that** the support mat (3) is fixed to a seg-

ment (10, 10', 10") by means of a support member (13).

8. Cleaning means (1) according to any of the preceding claims, **characterized in that** the mat-type piece (2) comprises two segments (10, 10', 10") in the width direction, and **in that** the ends of segments (10, 10', 10") facing each other are bent downwards and fixed to each other, in which case a folded point (9) forms between the segments (10, 10', 10").
9. Cleaning means (1) according to claim 8, **characterized in that** the ends of segments facing each other are fixed to each other with joint pieces.
10. Cleaning means (1) according to claim 9, **characterized in that** the adjacent segments (10, 10', 10") are fixed to each other with a joint part, which is fixed onto the joint pieces of the adjacent segments (10, 10', 10").

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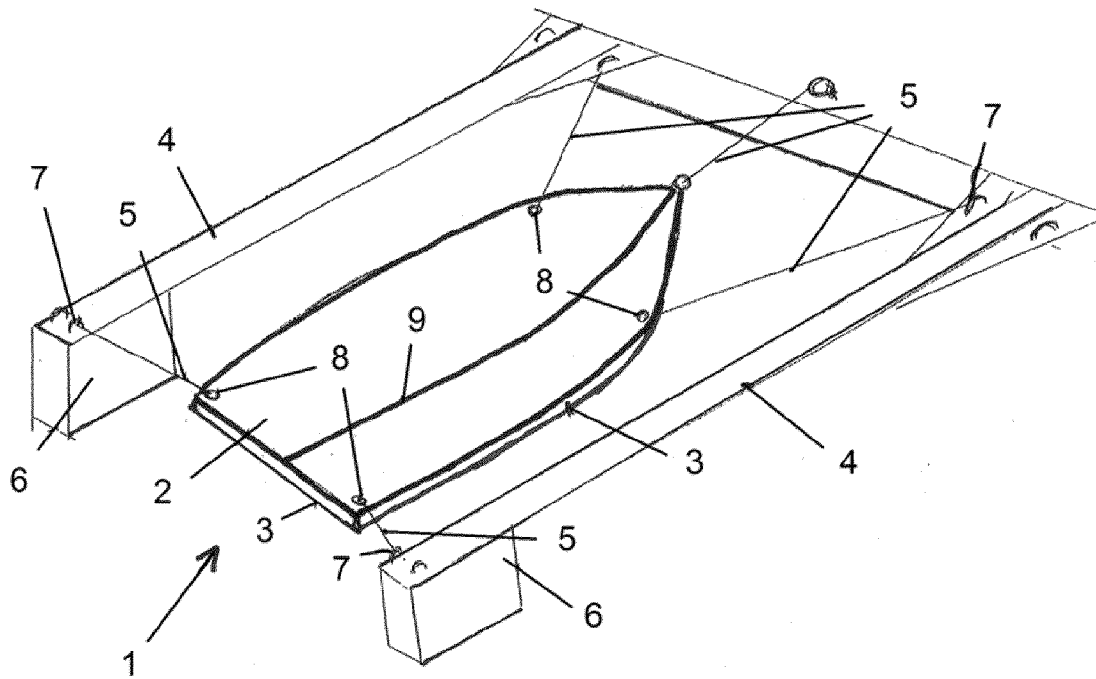


Fig. 1

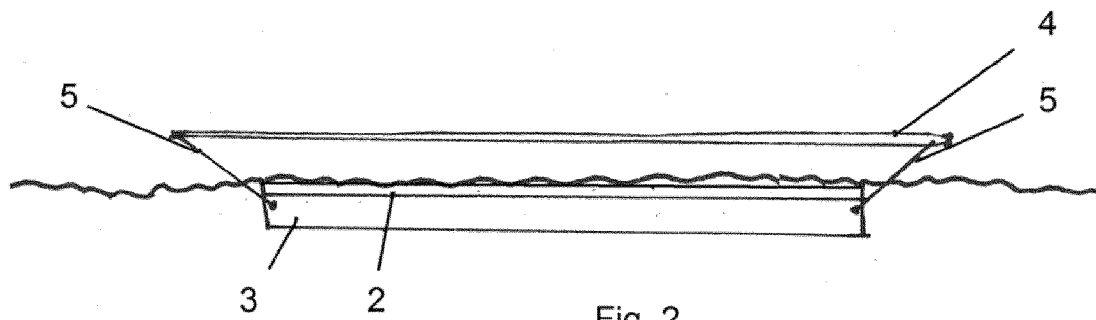
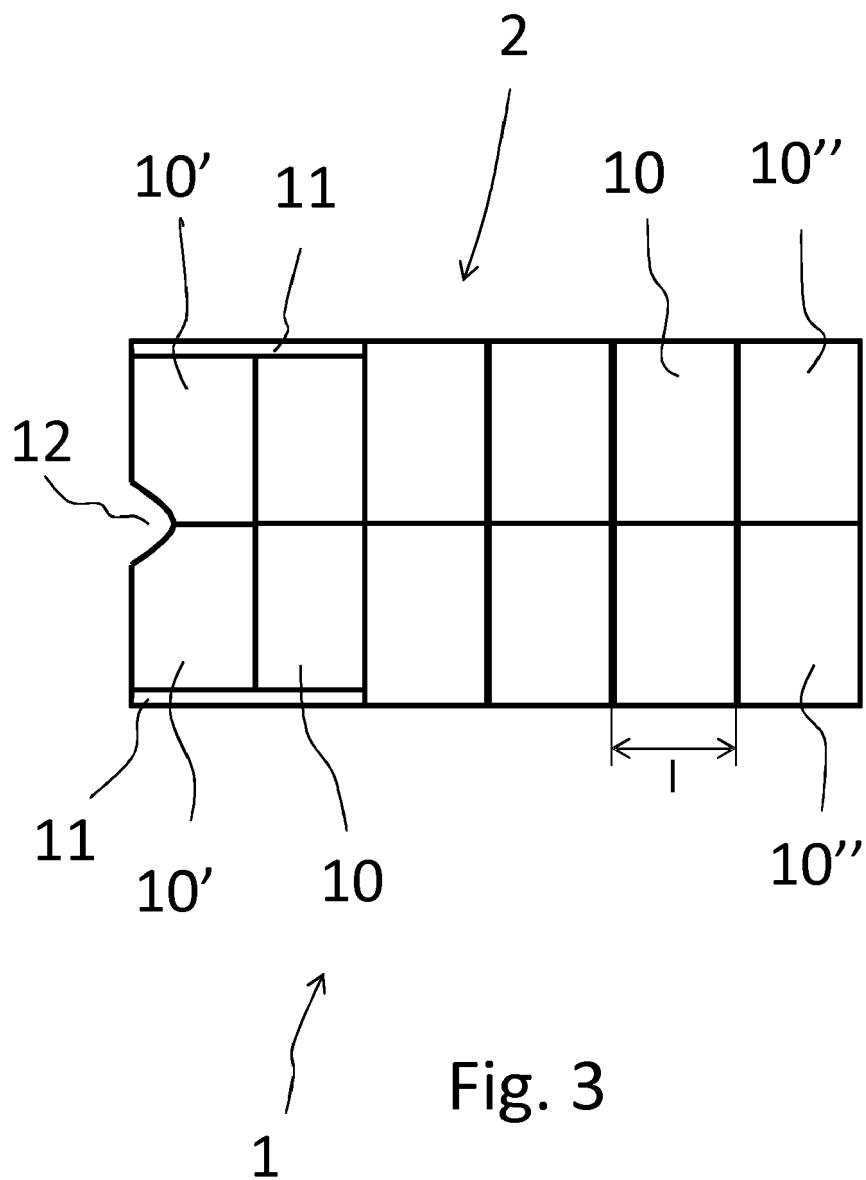
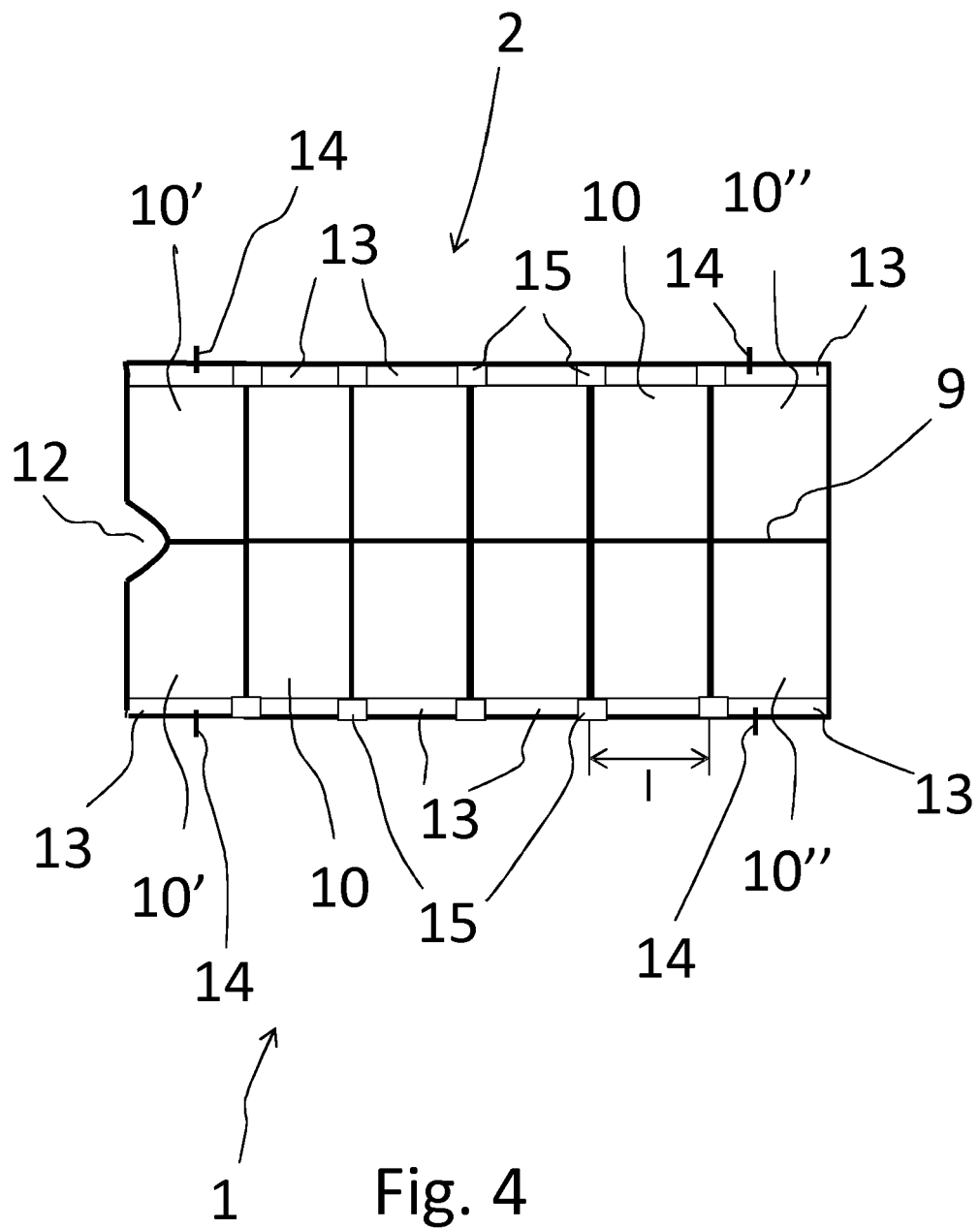


Fig. 2







EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 February 2015	Examiner Brumer, Alexandre
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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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