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(54) Noise-reducing device for water run-off channels

(57) The present invention concerns a noise-reducing device (10) for water run-off channels (13) of the type provided with run-off drains (14) at the bottom. The device (10) is equipped with a floating plate (2) in turn comprising

means (3) for staying engaged with the run-off drain (14) as the water level in the channel (13) varies and spacer means (4) to provide a water passage section, also with virtually zero water level in the run-off channel (13).

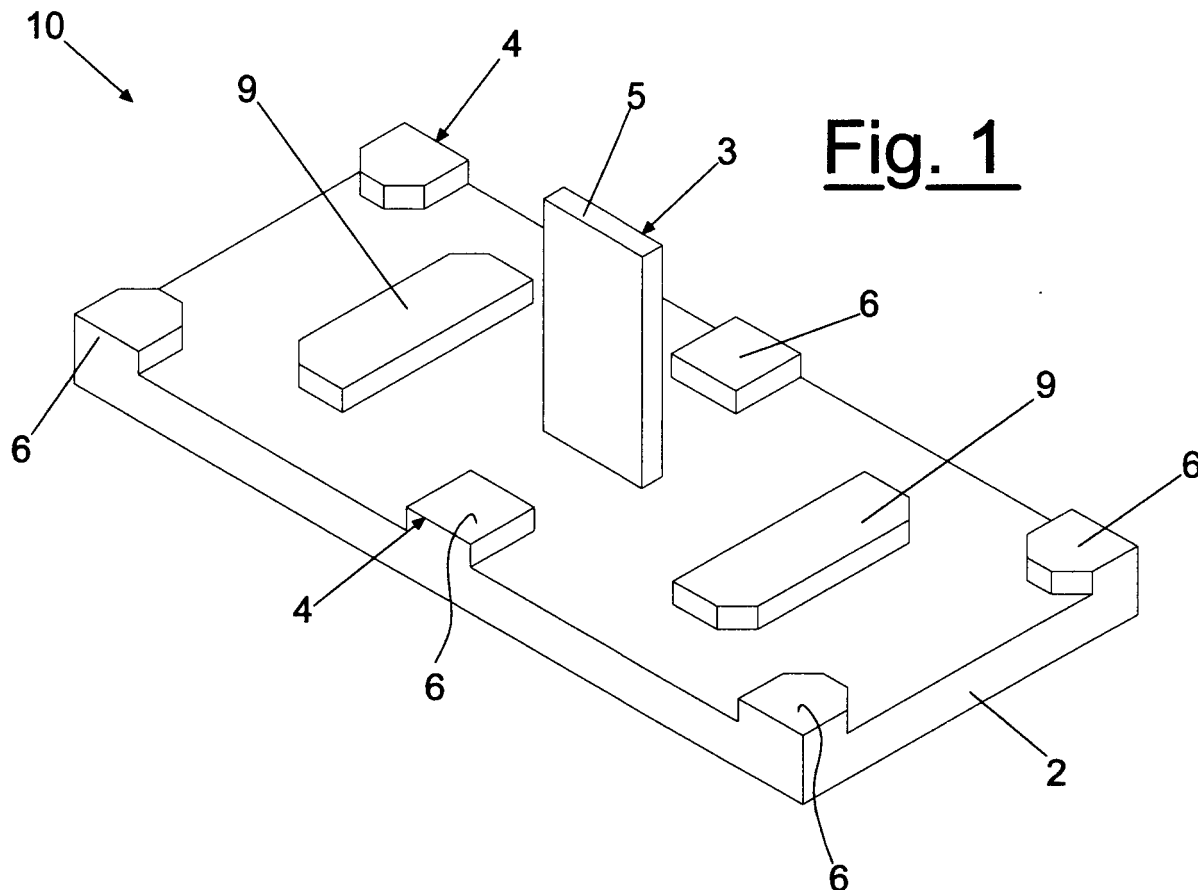


Fig. 1

Description

[0001] The present invention concerns a noise-reducing device for water run-off channels and in particular for water run-off channels of swimming pools with a sluice or overflow at the edge.

[0002] Swimming pools with a sluice at the edge, as known, work based upon a scheme that foresees a water pumping/treatment plant that picks up water from a so-called refill tank and injects it into the pool.

[0003] The pool is equipped with a perimetric channel, total or partial, into which the water spills, in other words into which the water pours, passing over the outer edge of the pool itself.

[0004] The water that spills into the perimetric channel flows by gravity towards drains or run-off holes, usually arranged at the bottom or in any case in a low position in the channel. From the run-off drains through piping, connected to the drains, and suitable collectors, the water arrives in the refill tank. The refill tank, in addition to containing the water reserve necessary for feeding the pumps when there are no users in the tank, is also used to store the volume of water corresponding, amongst other things, to that which spills into the perimetric channel as a consequence of the entry of possible users into the water.

[0005] One of the typical problems of this type of swimming pool is due to the noise that the water produces when entering the drains, and in the collector. Indeed, both the channel and the drains and collector are always oversized, since, in addition to the minimum volume of the pool not used, they have to also get rid of that which spills over due to the entry of users into the water, including peak times.

[0006] In falling into the drain and into the collector, the water, in addition to the noise of falling, also causes unpleasant sucking noises, due to the sucking of air into the drain generated by the swirling flow of the water entering into the drain itself.

[0007] In addition, it should be noted that such a phenomenon is amplified by the design requirement to oversize the drains and the collector.

[0008] In light of the above, there is clearly a need to be able to have a noise-reducing device, like the one according to the present invention, which allows the sucking effect to be eliminated or, in any case, considerably reduced and allows the noises of falling to be cut down.

[0009] Therefore, the purpose of the present invention is that of solving the problems of the prior art by providing a noise-reducing device that allows the sucking effect to be reduced and the noises of falling to be cut down.

[0010] Another purpose of the present invention is that of providing a noise-reducing device that is easy to install and cost-effective to make.

[0011] These and other purposes are accomplished by the noise-reducing device according to the present invention that has the characteristics of the attached claim 1.

[0012] Further characteristics of the invention are highlighted by the subsequent claims.

[0013] Substantially, a noise-reducing device according to the present invention is characterised in that it comprises a floating plate, suitable for being inserted into the run-off channel, in turn comprising means for staying in engagement with the run-off drain as the water level in the channel varies and spacer means for providing a water passage section, also with zero water level in the channel.

[0014] Further characteristics and advantages of the present invention shall become clearer following the present description, given for illustrating and not limiting purposes, with reference to the attached drawings, in which:

- figure 1 shows a perspective view from below of a preferred embodiment of the noise-reducing device according to the present invention;
- figure 2 shows a perspective view from above of the noise-reducing device of figure 1;
- figure 3 shows a section view of a perimetric run-off channel of an overflow swimming pool with the noise-reducing device of figure 1 inserted in minimum water level state; and
- figure 4 shows a section view of a perimetric run-off channel of an overflow swimming pool with the noise-reducing device of figure 1 inserted, in normal water level state.

[0015] With reference to the figures a preferred embodiment of a noise-reducing device for water run-off channels is shown. Such run-off channels are usually provided at the bottom, or in any case in a low position, with run-off drains connected, in a known way, by means of piping, not shown, to at least one refill tank.

[0016] As can be seen in figures 1-4, the noise-reducing device, wholly indicated with reference numeral 10, comprises at least one floating plate 2 of a size such as to allow it to be inserted into the run-off channel 13 and to allow all of the area involved in the falling of the water into the drain to be covered.

[0017] The floating plate 2 is in turn equipped with engagement means 3 for the run-off drain 14 and with spacer means 4 suitable for providing a passage section for the water, irrespective of the water level in the run-off channel 13.

[0018] The means 3 that allow the floating plate to stay engaged with the drain 14 irrespective of the water level that spills over the edge 15 of the pool and pours into the channel 13, are represented by a projecting tooth 5 arranged centrally in the lower portion of the floating plate 2.

[0019] The projecting tooth 5 is of a size such as to be inserted in the drain 14 and not significant block the water passage section in the run-off drain.

[0020] The tooth 5 also has the function of centring the plate 2 with respect to the drain 14.

[0021] It should also be noted that the projecting tooth

5 is of a suitable length that allows it, and consequently allows the floating plate 2, to always remain engaged with the drain 14, irrespective of the amount of water that enters into the run-off channel 13.

[0022] In detail, the projecting tooth 5 is of a length equal to the maximum at the depth h of the run-off channel 13.

[0023] The spacer means 4 comprise at least three shaped projections 6 suitable for resting upon the bottom of the channel 13 in minimum or zero water level conditions to make water passage sections, towards the drain 14, as shown in figure 3.

[0024] According to the preferred embodiment, shown in figures 1 to 4, six shaped projections 6 are foreseen three of which are arranged at an end of the plate 2, suitably spaced apart to create the water passage sections, and three, again spaced apart, at the opposite end with respect to the tooth 5.

[0025] Advantageously, according to the present invention, the floating plate 2 is made from flexible floating material, such as an expanded foam, but it could, however, be made from any other floating material without departing from the scope of protection of the present invention.

[0026] Foreseeing a flexible floating material allows the plate 2 to adapt to any wave configuration.

[0027] In other words, irrespective of the wave nature of the water in the channel 13, the plate 2 remains rested at the water surface not allowing the passage of air into the drain 14.

[0028] In the case of flexible floating material, at least two structural rigidifying elements 9 are foreseen, arranged centrally, suitable for avoiding the inflection of the plate 2 itself caused, for example, by sucking phenomena.

[0029] The rigidifying elements 9 consist, as shall be shown more clearly in figure 1, of further projections, suitably shaped, bound at the bottom to the floating plate and arranged transversally to the middle line of the plate 2.

[0030] It should also be noted that the rigidifying elements 9 are equipped with bevelled edges so as not to significantly reduce the water passage.

[0031] The operation of the noise-reducing device 10 according to the present invention is clear from what has been outlined above and in brief is the following.

[0032] Inserted in the run-off channel 13, with the tooth 5 engaged in the run-off drain 14, the device 10 according to the present invention constitutes a sort of floating plug that covers the possible left opening of the water in the drain 14 in minimum water level conditions in the channel 13, in such a way preventing sucking and cutting down the noise of falling.

[0033] In the present description the application of the present invention to run-off channels for swimming pools with an overflow at the edge has been illustrated, but it should be understood that it is not limited to such a specific application.

[0034] The noise-reducing device, object of the present invention could, indeed, be used to cut down or reduce the noises in any run-off channel of a fluid provided with holes or drains at the bottom or, in any case, low down in the channel.

[0035] The present invention has been described for illustrating but not limiting purposes, according to its preferred embodiments, but it should be understood that variations and/or modifications can be brought by men skilled in the art without for this reason departing from the scope of protection, as defined by the attached claims.

15 Claims

1. Noise-reducing device (10) for water run-off channels (13) provided with at least one run-off drain (14) **characterised in that** it comprises at least one floating plate (2) suitable for being inserted in said run-off channel (13) in turn comprising means (3) for staying engaged with said drain (14) as the water level in said run-off channel (13) varies and spacer means (4) to provide a water passage section towards said drain (14), also with zero water level in the run-off channel (13).
2. Noise-reducing device (10) according to claim 1, **characterised in that** said means (3) for staying engaged with said drain (14) comprise at least one projecting tooth (5) of a size such as to be inserted in said drain (14).
3. Noise-reducing device (10) according to claim 2, **characterised in that** said projecting tooth (5) is of a length at most equal to the depth of said channel (13).
4. Noise-reducing device (10) according to any one of the previous claims, **characterised in that** said spacer means (4) comprise at least three shaped projections (6) suitable for making water passage sections towards said drain (14), in minimum or zero water level conditions inside said channel (13).
5. Noise-reducing device (10) according to any one of the previous claims, **characterised in that** said spacer means (4) comprise at least six shaped projections (6) three of which are arranged, spaced apart, at an end of said plate (2) and three arranged, spaced apart, on the end of said plate (2) opposite said tooth (5).
6. Noise-reducing device (10) according to any one of the previous claims, **characterised in that** said floating plate (2) is made from flexible floating material.

7. Noise-reducing device (10) according to any one of the previous claims, **characterised in that** it comprises at least one structural rigidifying element (9) to avoid flexions in the central portion of the floating plate (2).

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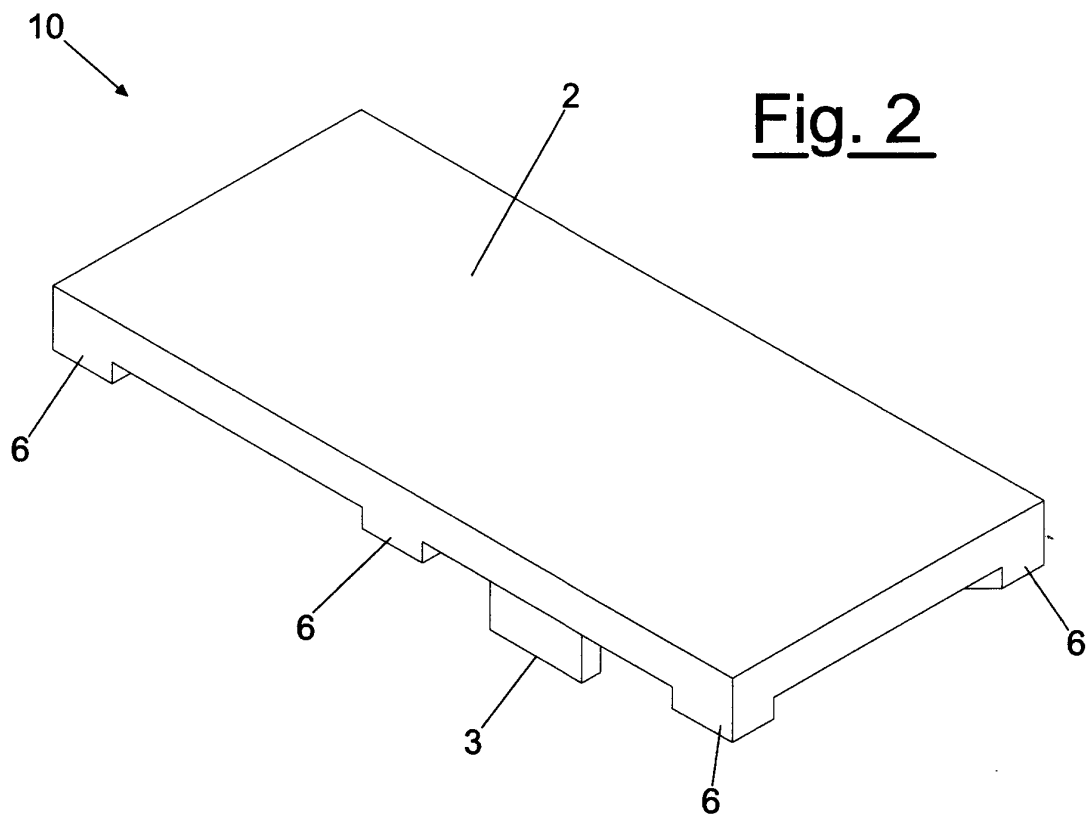
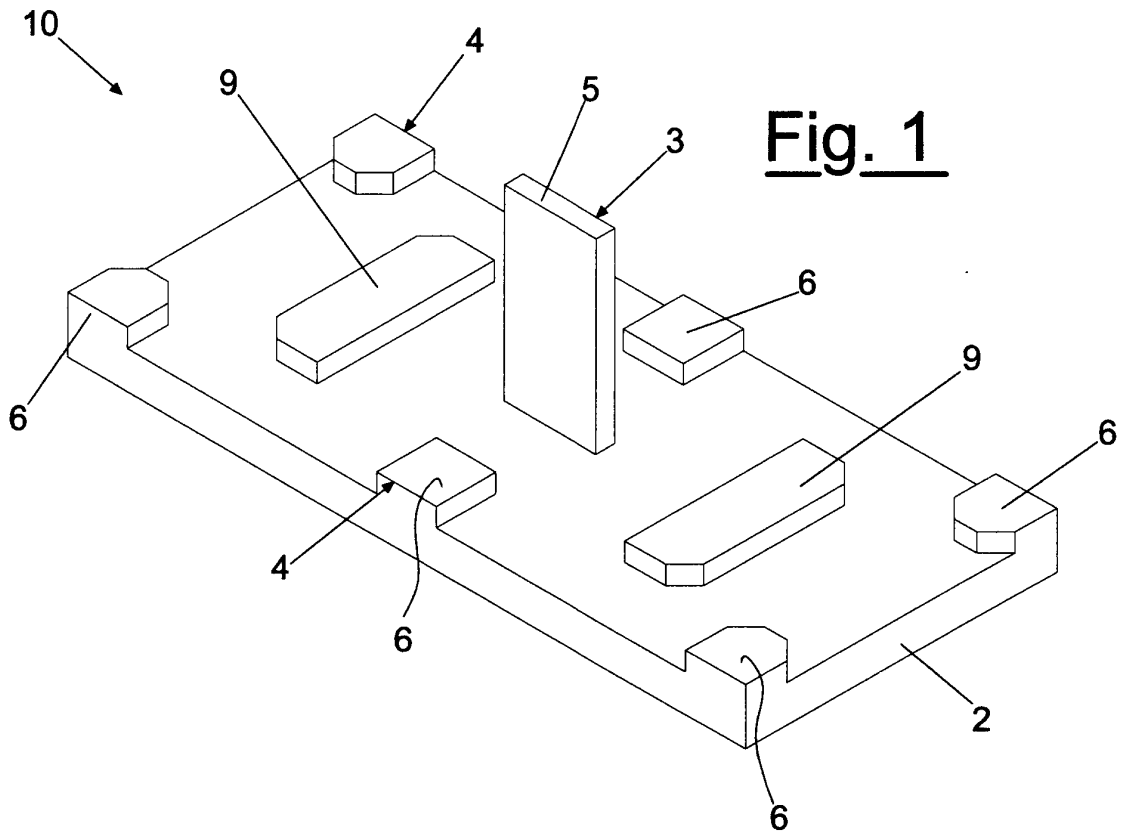


Fig. 3

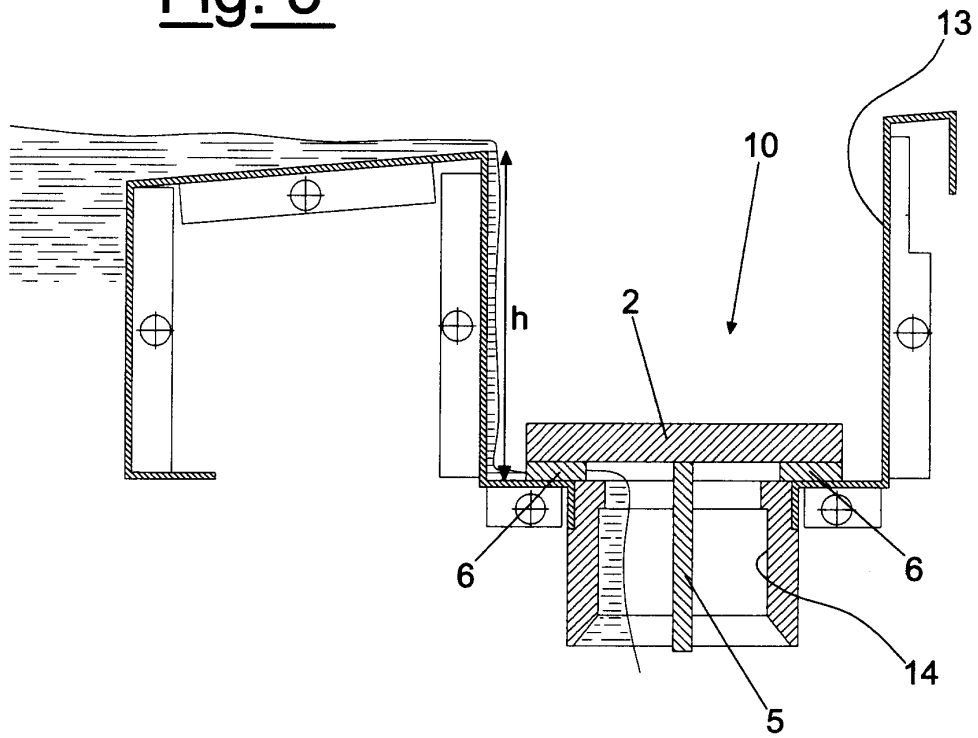


Fig. 4

