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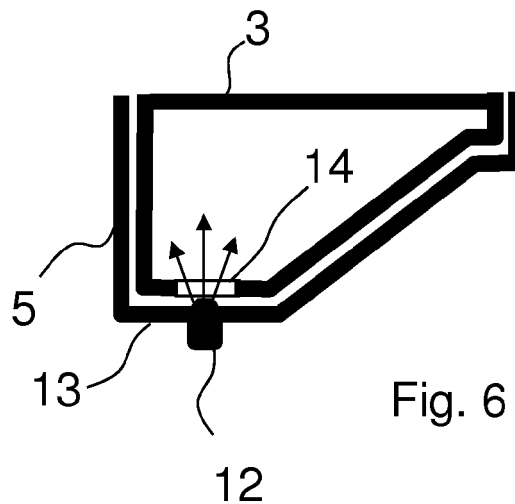
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(54) **Laundry dryer and condensate tank**

(57) The present application in particular relates to a laundry dryer (1) comprising a condensate tank (3) with an inner volume adapted to receive condensate fluid gen-

erated during laundry drying operations. It is proposed, that the laundry dryer further comprises a lighting unit (11, 12) adapted to illuminate the inner volume of the condensate tank (3).



Description

[0001] The present application in particular is directed to a laundry dryer comprising a condensate tank, and a corresponding condensate tank.

[0002] For laundry dryers and similar devices, it is often desirable to inspect a filling level of tanks or storage compartments. In particular for laundry dryers, it is desirable that a condensate tank adapted to collect condensate water generated during drying operations can easily be inspected by a user.

[0003] In WO 2011/012469, for example, an LED device may be provided at a front face of the condensate tank, adapted to indicate a filling level, in particular at least one of several filling stages of the condensate tank, to a user. However, this solution is comparatively complicated to implement.

[0004] Hence it is an object of the invention to provide a laundry dryer and corresponding condensate tank, which removes the inconveniences of the state of technology. In particular, a laundry dryer and condensate tank shall be provided which are adapted to enable a user to easily and comparatively quickly assess the filling level of the condensate tank.

[0005] These and other objects are obtained in accordance with the invention by claims 1 and 9. Preferred embodiments result from respective dependent claims.

[0006] According to claim 1, a laundry dryer is provided. The laundry dryer, i.e. tumble dryer, is adapted to dry laundry accommodated in a drying drum, by passing through comparatively dry air, i.e. process air, through the drying drum or drying chamber. After having passed the drying chamber or drum, the process air is guided through a condenser in which humidity removed from laundry and absorbed by the process air is removed from the process air. The condensate liquid, i.e. water, is guided, in particular pumped, in a corresponding condensate tank.

[0007] A corresponding condensate tank is part of the laundry dryer as proposed by claim 1. The condensate tank has an inner volume adapted to receive condensate fluid, in particular condensate water, generated during laundry drying operations, in particular as described in more detail beforehand.

[0008] Clearly, the inner volume of the condenser tank is restricted, in particular by constructional issues and available installation space within the housing of the laundry dryer, for example. Therefore it is desirable for a user to easily access and assess the filling level of the condensate tank in order to timely and at comparatively early stages empty the condensate tank to avoid situations in which operation of the laundry dryer, in particular during a drying cycle, is interrupted or halted.

[0009] Therefore, it is proposed that the laundry dryer comprises a lighting unit adapted to illuminate the inner volume of the condensate tank. Illuminating the overall inner volume of the condensate tank may help to more clearly recognize the actual filling level of the condensate

tank, in particular from the outside.

[0010] In particular in cases where at least a section of the front wall of the condensate tank is transparent and/or translucent, illuminating the inner volume of the condensate tank may be effective in visualizing the actual filling level at a respective transparent and/or translucent front section or wall of the condensate tank. Illuminating the inner volume in particular may increase a contrast of filled volume vis-à-vis an empty volume of the condensate tank.

[0011] The section of the front wall of the condensate tank being provided with transparent and/or translucent properties, may be part of a front plate or front cover, in particular be part of or constitute a section of a front control panel of the laundry dryer.

[0012] It is preferred, that the condensate tank is removably accommodated within a corresponding receiving housing or housing of the laundry dryer housing. In particular, it is preferred that the condensate tank is implemented as a drawer type tank, adapted to be drawn in and out of the receiving housing in a horizontal motion. In this case, the condensate tank and corresponding receiving housing are preferably adapted to slidably accommodate the condensate tank, i.e. that the condensate tank can be removed and installed in a sliding out and in motion.

[0013] As can be seen, providing a lighting unit which is adapted to illuminate the inner volume, in particular the inner volume at least in a cross sectional segment of the condensate tank, can help to more clearly visualize the filling level to a user. Illuminating the inner volume of the condenser tank in particular shall mean illuminating at least a section thereof near, at or in the region of the transparent front section or panel, in particular, allowing the light to shine through towards the outside. Further, illumination of the inner volume in particular shall mean that light immediately is coupled into the inner volume of the condensate tank where it spreads, for example via multiple reflections and/or deflections, across at least a section of the condenser tank, in particular a section or volume of the condenser tank visible from the outside.

[0014] The light preferably is coupled into the condensate tank at locations or sections that are filled with condensate liquid, in particular condensate water, in early stages of operational cycles of the laundry dryer, such that the advantageous effect of highlighting the condensate liquid level and respective filling level is obtained already in early stages of filling the condensate tank. Here it is preferred that light is coupled into the inner volume at and/or near a bottom wall of the condensate tank.

[0015] In a preferred embodiment, the lighting unit comprises at least one light source. The at least one light source preferably is positioned outside the condensate tank. This is of advantage with respect to constructional aspects. In addition, the condensate tank, implemented for example as a drawer type tank, may be implemented without integrated electrical elements and wiring. This in turn may ease handling of the condensate tank as no

wiring and the like may impair usage of the condensate tank.

[0016] In the current embodiment, it is preferred, that the at least one light source is positioned and adapted to directly couple light into the inner volume via at least one transparent window provided in the condensate tank wall. It shall be noted, that illumination of the inner volume may be conducted through transparent and/or translucent plastic walls of the condensate tank, for example. However, using transparency and/or translucence of generic wall materials, in particular plastic materials, may involve increased attenuation of the light and thereby adversely affect visualization of the filling level of the condensate tank. However, illuminating the inner volume through generic wall materials shall be considered to lie within the scope of the present invention.

[0017] The transparent window preferably is implemented as an insert in a cutout and/or recess and/or opening in a wall of the condensate tank. The insert, i.e. transparent window, may be manufactured from a transparent plastic material or glass, and/or at least comprise an optical element, preferably made from glass or any suitable and comparable material. Using a glass material or similar, in particular transparent plastic materials, has the advantage that light can be coupled into the inner volume of the condensate tank essentially without any attenuation and weakening, such that highlighting the filling level of condensate liquid by illuminating respective condensate liquid, in particular condensate water, is most effective.

[0018] In one embodiment and variant, is provided that the transparent window comprises a lens adapted to spread light impinging thereon into the inner volume of the condensate tank. Here, illumination efficiency and highlighting the actual filling level can be improved, such that the actual filling level can be recognized comparatively easy. A lens is one of a preferred optical element that can be used in connection with the transparent window. However, it shall be noted that also other optical elements, such as prisms and the like, may be used in connection with the transparent window. The optical elements preferably are selected to at least one of enhance coupling of light into the inner volume and spread light coupled into the condensate tank over at least a section of the inner volume, preferably in a direction, i.e. main direction, towards the transparent and/or translucent section of the front wall or plate of the condensate tank.

[0019] In a yet further embodiment, the at least one light source and/or transparent window is provided at or near at least one of a bottom wall and side wall of the condensate tank or receiving housing adapted to removably accommodate the condensate tank. This in particular shall mean that the at least one light source and/or transparent window is provided and mounted in such a way, that light can be coupled into the inner volume of the condensate tank from at least one of a bottom wall and/or a side wall section of the condensate tank. In particular in these configurations, sections of the con-

densate tank, in particular bottom sections thereof, which are filled or covered with condensate liquid at early stages may be illuminated and respective filling levels may be highlighted already in early stages in the course of filling the condensate tank.

[0020] In any case, the arrangement of the at least one light source and at least one transparent window preferably is such that in the inserted state, i.e. in the state in which the condensate tank is mounted and/or placed in a corresponding receiving housing of the laundry dryer, the light source and transparent window coincide. This in particular means that a respective light source and transparent window are mutually aligned, i.e. overlaid, in particular placed above each other. Mutual alignment, in particular the overlay, preferably is such that a maximum of light, in particular essentially all light emitted from the light source, can be coupled via the transparent window into the respective inner volume of the condensate tank.

[0021] In a further embodiment, at least one light source of the lighting unit is integrated in a supporting wall of a receiving housing adapted to removably accommodate the condensate tank. The supporting wall may be at least one of a bottom and side wall of the receiving housing.

[0022] Providing the light source in a respective supporting wall may be advantageous for avoiding wiring at and/or on the removable condensate tank. Hence handling of the condensate tank can be simplified. In cases, in which the light source, i.e. at least one light source, of the lighting unit, is integrated in or within a supporting wall of a receiving housing, optical elements adapted to optimally couple light of the light sources into the condensate tank, may be provided at or on the supporting wall. Also, as already mentioned, the transparent window or windows, mutually aligned with the at least one light source in the inserted state of the condensate tank, may comprise optical elements for optimally coupling light of the at least one light source into the condensate tank such that the filling level of condensate liquid can be readily recognized from outside the condensate tank.

[0023] Regarding the arrangement and/or mutual positions of the at least one light source and corresponding transparent window, respective pairs of elements shall be aligned and positioned such that in the inserted state of the condensate tank, in particular a the state in which the condensate tank is inserted or drawn into the receiving housing, mutually match to obtain optimal influx of light into the condensate tank.

[0024] In a further embodiment, it is provided that the condensate tank comprises at a front face at least one transparent inspection window adapted for visual inspection of the inner volume of the condenser tank. Such an inspection window preferably is made from a sufficiently transparent and/or translucent material, such as glass and/or a corresponding plastic material.

[0025] It shall be noted, that illumination of the inner volume may lead to a situation in which the filling level of the condensate tank shines through a translucent, in

particular plastic, front wall section of the condensate tank. However, it is not always the case that the front wall of respective condensate tanks is of adequate and sufficiently translucent materials, in particular with respect to design issues.

[0026] Providing however an inspection window is effective in giving easy access to the illuminated condensate liquid contained within the condensate tank. In particular, the inspection window is effective in giving easy access to the filling level contrasted from the condensate tank, i.e. condensate tank wall materials, by illuminating the inner volume of the condensate tank, i.e. by illuminating the condensate liquid contained within the condensate tank.

[0027] The inspection window may be implemented in a vertical orientation, i.e. it may run in bottom up orientation, i.e. from a bottom to a top section of the front wall or front face of the condensate tank. It is preferred, that the inspection window extends over essentially the whole height of the condensate tank. In case that the front wall or front face comprises or constitutes a handle, in particular in form of an undercut recesses, it is preferred, that the inspection window extends and also is implemented at or in respective handle sections of the front face or front wall.

[0028] In any case, it is of particular advantage, if the inspection window, which may be an elongated transparent section of the front wall, extends over the whole height of the condenser tank and admits adequate, and preferably essential equal, visual inspection of any filling level over the whole height, i.e. longitudinal extension, of the inspection window.

[0029] In a preferred embodiment, the lighting unit comprises as a light source at least one LED, i.e. light emitting diode. The at least one LED may be at least one of a white and/or colored LED. Colored LED's may be advantageous in better contrasting the filling level, i.e. condenser liquid contained within the condensate tank, in particular from the condensate tank housing. Further, color effects may be used in dependence of an actual filling level, which for example shall mean that for and with low filling levels a moderate color can be used, wherein at or with comparatively high filling levels, a signal color can be used. In particular, a bottom LED adapted to couple light into the condensate tank at a bottom section thereof may emit a moderate color, whereas an LED provided at a higher level, i.e. emitting light into the condensate tank at a higher filling level, may emit a signal color. In case that the condensate level reaches the level of the signal color LED, the condensate liquid will, at least in a respective section or volume, be illuminated and contrasted in the respective signal color and/or a mixed color.

[0030] In an embodiment, and as already indicated further above, it is preferred that a handle is provided at a front face of the condensate tank, and that the transparent inspection window spreads over the handle. This in particular shall mean that the filling level shall be accessible also in regions crossed or traversed by the handle

or elements thereof. The handle may for example be implemented as a horizontal undercut recess. However, any other type and geometry may be used or the handle.

[0031] According to claim 9, a condensate tank is provided, which is adapted to be, in particular removably, coupled to a laundry dryer, in particular a receiving housing of a laundry dryer. The laundry dryer intended to be used with the condensate tank may in particular be and preferably is implemented and designed as described in any embodiment and variant further above.

[0032] The condensate tank comprises in a condensate tank wall at least one transparent window adapted to couple light into the volume of the condensate tank in the state coupled to the laundry dryer. With respect to the transparent window, in particular designs, characteristics, position and the like, reference is made to the description above. Respective features and characteristics of the transparent window as described above and further above shall apply mutatis mutandis. As to advantages and advantageous effects, reference is made to the description above.

[0033] In an embodiment of the condensate tank, condensate tank walls are made from a plastic material, and the at least one transparent window is made from at least one of a transparent plastic material and glass.

[0034] A further embodiment provides that the front face of the condensate tank, in particular the front wall of the condensate tank comprises a transparent inspection window. The inspection window may, and in embodiments and variants is, implemented as described further above. In particular, the variant in which at least a section of the inspection window is integrated in a handle of the condensate tank shall apply mutatis mutandis. As to advantages, reference is made to the description above.

[0035] Preferred embodiments of the invention will now be described in connection with the annexed figures, in which

- Fig. 1 shows a first schematic view of a laundry dryer;
- Fig. 2 shows a second schematic view of a laundry dryer;
- Fig. 3 shows a perspective view of a condensate tank;
- Fig. 4 shows a front view of the condensate tank;
- Fig. 5 shows a detail of a lighting unit of the laundry dryer;
- Fig. 6 shows a detail of Fig. 5 with the condensate tank inserted in a corresponding receiving housing;
- Fig. 7 shows a variant of the lightning unit of Fig. 5;

- Fig. 8 shows a first variant of the configuration in Fig. 6;
- Fig. 9 shows a first variant of the configuration in Fig. 7;
- Fig. 10 shows a second variant of the configuration in Fig. 6;
- Fig. 11 shows a second variant of the configuration in Fig. 7;
- Fig. 12 shows a top and front view of the receiving housing in accordance with Fig. 7;
- Fig. 13 shows a situation devoid of illuminating the inner volume of the condensate tank
- Fig. 14 shows the situation of Fig. 13 during ordinary operation of the laundry dryer;
- Fig. 15 shows a situation of illuminating the inner volume of the condensate tank; and
- Fig. 16 shows a situation of illuminated inner volume as visible through an inspection window.
- Fig. 17 shows a top and front view of the receiving housing in accordance with Fig. 9;
- Fig. 18 shows a situation devoid of illuminating the inner volume of the condensate tank in Fig. 17;
- Fig. 19 shows the situation of Fig. 18 during ordinary operation of the laundry dryer;
- Fig. 20 shows a situation of illuminating the inner volume of the condensate tank in Fig. 17; and
- Fig. 21 shows a situation in Fig. 20 of the illuminated inner volume as visible through an inspection window.

[0036] Note that elements similar and/or equal in function will be designated by identic reference signs. Features shown any embodiment related to the figures may be implemented alone, in particular to the extent described further above.

[0037] Fig. 1 shows a first schematic view of a laundry dryer 1. The laundry dryer 1 comprises a drying drum or chamber 2 adapted to accommodate laundry to be dried. During a drying cycle, air, in particular dry air, is conducted through the drying chamber 2 in order to absorb and remove humidity from laundry within the drying chamber 2. The humid air in general is then guided to a condenser for extracting humidity from air cycled through the laundry drying chamber 2.

[0038] Humidity, in particular and generally water, re-

sulting from the condensing step in general is collected and/or conducted to a condensate tank 3 provided within the casing of the laundry dryer 1. In the configuration shown in Fig. 1, the condensate tank 3 is provided within an upper user service panel, easily accessible from a front side of the laundry dryer 1. Note that the condensate tank 3 may also be provided at a lower, in particular bottom, front site of the laundry dryer 1.

[0039] The condensate tank 3 in the present implementation and configuration is designed as a drawer type condensate tank accessible from the front side of the laundry dryer 1 and removable from a corresponding receiving housing in a horizontal drawing action. In other words, the condensate tank 3 is adapted to be pushed out and in from a front end user face of the laundry dryer 1. Note that the condensate tank 3 may also be provided in a removable manner at a lower side of the front side of the laundry dryer 1.

[0040] The front end side of the laundry dryer 1 accommodating the condensate tank 3 in the present case comprises several control and/or display elements 4 adapted to provide control and/or display information of operational details of the laundry dryer 1 to a user.

[0041] Fig. 2 shows a second schematic view of a laundry dryer. The second configuration in Fig. 2 differs from that of Fig. 1 in that the condensate tank 3 is removed from a corresponding receiving housing 5. In Fig. 2, the opening of the receiving housing 5 towards the front end side of the laundry dryer is visible. As can be seen, the receiving housing 5 and correspondingly the condensate tank 3 both have polygonal cross sections. The polygonal cross sections in principle correspond to a rectangular shape with one edge being cut off. Note that also other shapes may be used for the condensate tank 3 and receiving housing 5.

[0042] For operational convenience, it is desirable that a user can easily recognize and identify a filling level of the condensate tank 3, in order to timely empty the condensate tank 3. In this way, situations in which a drying cycle has started and has to be interrupted again due to a full condensate tank condition can be avoided. For this reason the invention as described herein provides a possibility to more clearly indicate or visualize filling levels of the condensate tank 3 to a user. Fig. 3 shows a perspective view of the condensate tank 3, in a state removed from the receiving housing 5. The condensate tank 3 comprises a front plate 6 or front cover, in accordance with the design shown in Fig. 1 and Fig. 2, and generally adapted to fit to the front panel of the laundry dryer 1. At or in the front plate 6, a handle 7 is provided, which in the present case is implemented as an undercut recess, indicated in Fig. 1 and Fig. 3 by a horizontal line. The handle 7 is adapted to push the condensate tank 3 into and out of the receiving housing 5.

[0043] The condensate tank 3 further comprises a discharge opening 8 adapted to discharge liquid, i.e. water, collected in the condensate tank 3 during laundry drying operations. The discharge opening 8 may also be used

as an inlet opening for feeding condensate water from a condenser of the laundry dryer 1 into the condensate tank 3. The condensate tank 3 preferably is implemented, as shown in Fig. 3, as an essentially closed vessel having at least one inlet and/or outlet opening. The condensate tank 3 as such may be made from a plastic material or any other suitable material.

[0044] For the reason of indicating or providing a user with information related to the filling level of the condensate tank 3, at least a section of the front wall 9 of the condensate tank 3 and front plate 6 presently are made from a transparent and/or translucent material. In general the condensate tank 3 as such may be made from a plastic material, in particular translucent or transparent plastic material. However a respective translucent material alone has been shown to be not suitable for clearly distinguishing or recognizing filling levels of the condensate tank 3.

[0045] For enhanced visibility, the transparent or translucent section may be implemented as an inspection window 10, as shown in more detail in Fig. 4 showing a front view of the condensate tank 3, in particular front plate 6. The inspection window 10 may be made as a type of insert at least one of provided in or at the front plate 6 and front wall 9.

[0046] In particular, the inspection window 10 may be made from a transparent plastic material or glass. The transparent plastic material and/or glass is advantageous for inspecting through the inspection window 10 a filling level of condensate liquid within the condensate tank 10. Inspecting the filling level of the condensate tank 10 in particular means inspecting the inner volume of the condensate tank 10 or at least a section thereof, wherein the inner volume may be any part or section of the volume of the condensate tank 10. In particular the inner volume or a respective or relevant section thereof, may be a section of the condensate tank volume near, in the region of and/or adjacent to the front wall 9 of the condensate tank 3.

[0047] In order make a certain filling level of condensate liquid within the condensate tank 3 to be more easily and rapidly recognized by a user, the laundry dryer 1 comprises, as depicted in Fig. 5, a lighting unit 11. The lighting unit 11 in general is adapted and configured to illuminate the inner volume, at least, however, a section of the inner volume of the condensate tank 3. Preferably, the lighting unit 11 is adapted to directly illuminate the inner volume, in particular a respective section of the inner volume, of the condensate tank 3.

[0048] Fig. 5 shows an upper section of the laundry dryer 1 in the configuration of Fig. 2, i.e. in which the condensate tank 3 is removed or drawn out from the receiving housing 5. The lighting unit 11 comprises in the present variant a light source 12, in other variants, however, several light sources in particular of different colors, may be provided. In particular LED's may be used as light sources as they are sufficiently bright and require minimal installation space.

[0049] The light source 12 of the lighting unit 11 in the present case is mounted to, at or in a bottom wall 13, in particular flush with a bottom wall 13, of the receiving housing 5. The light source 12 as shown in Fig. 5 further is mounted in such a way that a main direction of light emission is oriented bottom up, i.e. from the bottom wall 13 in upward direction.

[0050] Fig. 6 shows the situation as depicted in Fig. 5 with the condensate tank 3 being inserted into the receiving housing 5. In the configuration of Fig. 6 a transparent window 14 is provided in a bottom wall of the condensate tank 3. The transparent window 14 is positioned and arranged such that the transparent window 14 essentially overlays the light source 12, in particular a light emission face thereof, in the inserted state of the condensate tank.

[0051] The light source 12 and transparent window 14 are adapted such that the light source can directly couple light into the condensate tank volume, at least a section, in particular predefined section, of the condensate tank 3.

[0052] The transparent window 14 may be made from a transparent plastic material and/or from a glass material, in particular conventional glass. The transparent window 14 may be provided as an insert adapted to be fluid tightly inserted in a corresponding opening of a respective wall, in particular bottom wall, of the condensate tank 3.

[0053] The transparent window 14 may comprise at least one optical element, in particular a lens and the like, which optical element may be adapted to optimally spread light emitted from the light source 12 into the inner volume, in particular relevant inner volume near, at or close to the transparent window 14, of the condensate tank 3.

[0054] Fig. 7 shows a variant of the lighting unit of Fig. 5. In contrast to the situation shown in Fig. 6, the light source 12 in the present case is positioned below the receiving housing 5, in more detail below the bottom wall 13. Note that in Fig. 7, the condensate tank 3 is not inserted into the receiving housing 5. In the bottom wall there is provided a transparent window 14, which may be implemented similar to the transparent window described in connection with Fig. 6 and reference is made to the respective part of the description which shall apply mutatis mutandis. In particular, the transparent window may be a lens or the like.

[0055] The configuration shown in Fig. 7 in particular can be used, if the condensate tank 3, at least respective walls thereof, such as the bottom wall, are made from a transparent, at least translucent, material, in particular plastic material. The transparent window 14 may be made from glass, and provided at least one of a protecting function and optic function. As an optic function, the transparent window 14, at least a section thereof, may be implemented as a lens. The lens or lens section may be adapted and optimized such that light emanating from the light source 12 is adequately distributed into the condensate tank 3.

[0056] Fig. 8 and Fig. 9 show first variants of the con-

figurations shown and depicted in Fig. 6 and Fig. 7, respectively. The difference to the configurations in Fig. 6 and 7 is, that the light source 12 in both cases is arranged in or, respectively, at the vertical side wall 15. The light source in or at the vertical side wall 15 may be used as an alternative to the position in Fig. 6 and 7. However, it is also possible that both variants are used simultaneously, i.e. that light sources 12 are positioned and arranged at the bottom wall 13 and vertical side wall 15. Note that other and in particular additional light sources 12 and locations for the light sources 12 may be provided.

[0057] In contrast to the variant shown in Fig. 6 and Fig. 7, illumination of the inner volume of the condensate tank 3 will be effective only at a certain level above the bottom wall 13 of the condensate tank 3.

[0058] Further reference is now made to Fig. 10 and Fig. 11, respectively showing second variants of the configurations in Fig. 6 and Fig. 7. Reference is also made to the description above.

[0059] The second variants differ from those of Fig. 6 to 9 in that the light source 12 is arranged in (see Fig. 10) or at (see Fig. 11) the receiving housing 5, in more detail in or at respective slanted side walls 16. Similar to the variants in Fig. 8 and Fig. 9, the second variants may be used alone or in combination with at least one variant described in connection with Fig. 6 to Fig. 9. In particular, any combinations, in particular positions of the light source and arrangement thereof, are conceivable. In particular, it is conceivable that for different locations of the light sources 12, different colors for the light sources 12 are used. With adequate arrangements and positions of the light sources 12 the condensate tank 3 thus can be illuminated in layers of different color, for example, respectively indicating a certain filling level of the condensate tank 3.

[0060] Note that the slanted side wall 16 is provided for space saving reasons. Therefore, it shall be noted that the condensate drawer 3 may have a different design, in particular different cross section.

[0061] From the variants shown in Fig. 6 to Fig. 10 it becomes clear, that different illumination scenarios of the inner volume of the condensate tank 3 may be obtained and implemented by placing the light source 12 at respective different locations. In particular in selecting respective illumination scenarios, different illumination effects may be obtained.

[0062] Fig. 12 shows a top and front view of the receiving housing 5 in accordance with Fig. 7. The transparent window 14 is arranged at and near the front section, i.e. a section close to the front plate 6 of the condensate tank 3 in the inserted state. Light emanating from light source 12 penetrates the transparent window 14 and spreads thereafter in favored or desired directions, which, by the way, may be defined by optical properties of the transparent window 14.

[0063] Light spreading in this way can enter the condensate tank 3, may it be through a transparent opening or a transparent or translucent wall, and penetrate into

the liquid being present in the condensate tank 3.

[0064] Fig. 13 shows a situation devoid of illuminating the inner volume of the condensate tank 3. No light rays or beams hit the inner volume and condensate liquid 17 collected within the condensate tank 3. Hence, the filling level of the condensate liquid 17 within the condensate tank 3 is not highlighted and contrasted for better recognizability. Hence, it is difficult for a user to observe the filling level 18 of the condensate tank 3, which situation is schematically indicated in Fig. 14 by a weak condensate level line.

[0065] Fig. 15 shows a situation in which the inner volume, in particular condensate liquid 17, is illuminated by the light source 12, in that the light source 12 emits light towards and into the inner volume of the condensate tank 3. As is indicated by a plurality of arrows, the light coupled into the inner volume of the condensate tank 3, in particular condensate liquid 17, is reflected, in particular at the condensate-to-air surface, and within the condensate liquid 17 and thereby spreads within the condensate liquid 17. As a result, the condensate liquid 17 as such, in any case the filling level 18 of the condensate liquid within the condensate tank 3, is highlighted and better contrasted as compared to the situation without illumination as depicted in Fig. 13 and fig. 14..

[0066] The effect of illuminating the inner volume of the condensate tank 3, in particular condensate liquid 17 contained within the condensate tank 3, with the purpose of inducing enhanced visibility, recognizability and contrast of the filling level 18 as visual or visible from and through the inspection window 10 greatly eases recognition of the filling level, such that a user can timely empty the condensate tank 3.

[0067] As already mentioned, with adequate illumination, the condensate liquid 17 and therefore the filling level 18, in particular a border between filled and empty space, can be clearly and easily recognized in and by the inspection window 14, which is indicated in Fig. 16 in which the condensate liquid 17 within the condensate tank 3 and therefore also the filling level is clearly visible from the outside.

[0068] Similar situations will occur and will be obtained with the configurations shown throughout Fig. 6 to Fig. 11.

[0069] Fig. 17 to 21 respectively show situations essentially corresponding to those of Fig. 12 to 16, with the difference, that the light source 12 is positioned at the vertical side wall 15. Similarly, and as can be seen throughout Fig. 18 to Fig. 21, the filling level of the condensate liquid 17 within the condensate tank 3 can be readily seen, in particular recognized and highlighted, in utilizing the light source 12 for illumination. Hence, the user will timely recognize inadequate high filling levels and can empty the condensate tank 3 in time and at adequate intervals.

[0070] It shall be noted that illuminating the inner volume, in particular condensate liquid 17, at least a section or part thereof, may be implemented in a way different from that shown in connection with the figures. In other,

in more general words, the configurations shown in the Figures shall not be construed as limiting the scope of the invention as defined in the claims.

List of reference numerals

[0071]

- 1 laundry dryer
- 2 drying chamber
- 3 condensate tank
- 4 control and/or display element
- 5 receiving housing
- 6 front plate
- 7 handle
- 8 discharge opening
- 9 front wall
- 10 inspection window
- 11 lighting unit
- 12 light source
- 13 bottom wall
- 14 transparent window
- 15 vertical side wall
- 16 slanted side wall
- 17 condensate liquid
- 18 actual filling level

Claims

- 1. Laundry dryer (1) comprising a condensate tank (3) with an inner volume adapted to receive condensate fluid generated during laundry drying operations, and further comprising a lighting unit (11, 12) adapted to illuminate the inner volume of the condensate tank (3). 50
- 2. Laundry dryer (1) according to claim 1, wherein the lighting unit (11) comprises at least one light source (12) positioned outside the condensate tank (3), and wherein the at least one light source (12) is posi-

tioned and adapted to directly couple light into the inner volume via at least one transparent window (14) provided in a condensate tank wall (13, 15, 16).

- 5 3. Laundry dryer (1) according to claim 2, wherein the transparent window (14) comprises a lens adapted to spread light impinging thereon into at least a section of the inner volume of the condensate tank (3).
- 10 4. Laundry dryer (1) according to at least one of claims 2 and 3, wherein the at least one light source (12) and/or transparent window (14) is provided at or near at least one of a bottom wall (13) and side wall (15, 16) of the condensate tank (3) or a receiving housing (5) adapted to removably accommodate the condensate tank (3).
- 15 5. Laundry dryer (1) according to claim 4, wherein the at least one light source (12) is integrated in a supporting wall (13, 15, 16) of the receiving housing (5).
- 20 6. Laundry dryer (1) according to at least one of claims 1 to 5, wherein the condensate tank (3) comprises at a front face (6, 9) at least one transparent inspection window (10) adapted for visual inspection of the inner volume of the condensate tank (3).
- 25 7. Laundry dryer (1) according to at least one of claims 1 to 6, wherein the lighting unit (11) comprises as a light source (12) at least one LED.
- 30 8. Laundry dryer (1) according to at least one of claims 1 to 7, wherein a handle (7) is provided at a front face (6, 9) of the condensate tank (3), and wherein the at least one transparent inspection window (10) preferably spreads over the handle (7).
- 35 9. Laundry dryer (1) according to at least one of claims 1 to 8, wherein the condensate tank is removably couple to the laundry dryer and comprises a condensate tank wall having at least one transparent window (14) adapted to couple light into the volume of the condensate tank (3) in the state coupled to the laundry dryer (1).
- 40 10. Laundry dryer (1) according to at least one of claims 1 to 9, wherein the condensate tank walls are made from a plastic material, and wherein the at least one transparent window (14) is made from at least one of a transparent plastic material and glass.
- 45 11. Laundry dryer (1) according to at least one of claims 1 to 10, wherein at a front face (6, 9) of the condensate tank (3) a transparent inspection window (14) is provided.

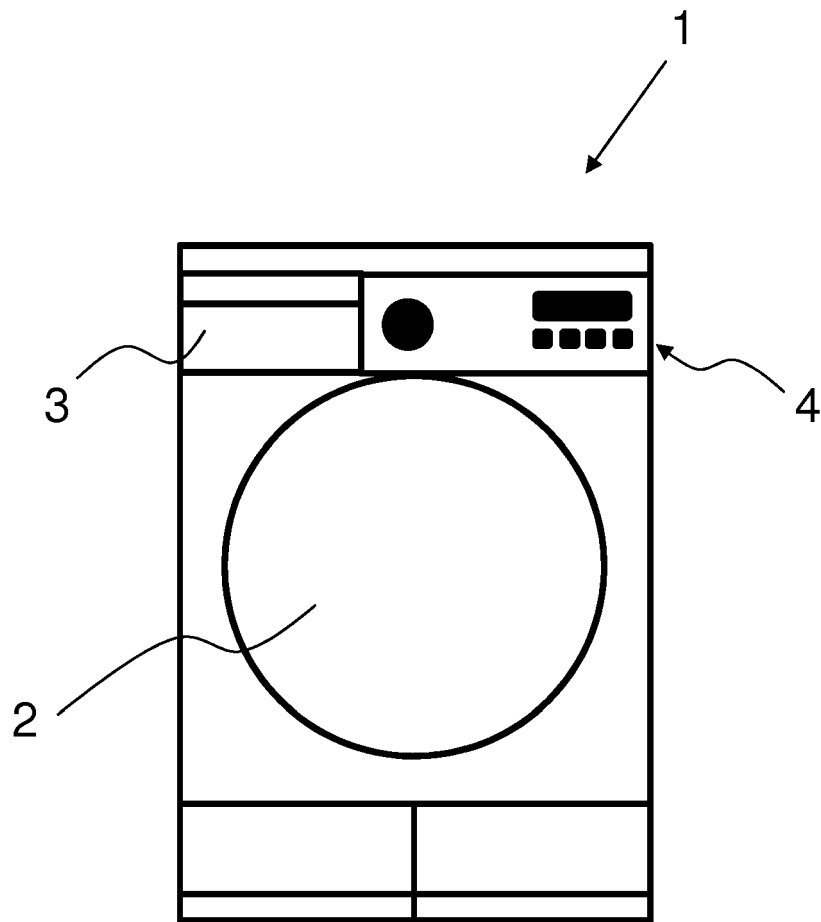


Fig. 1

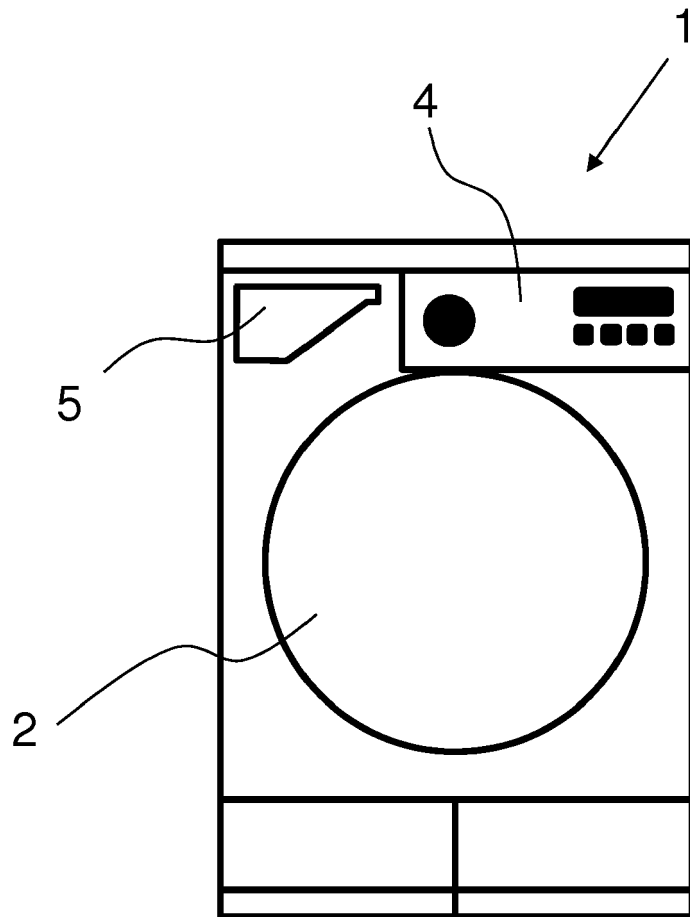


Fig. 2

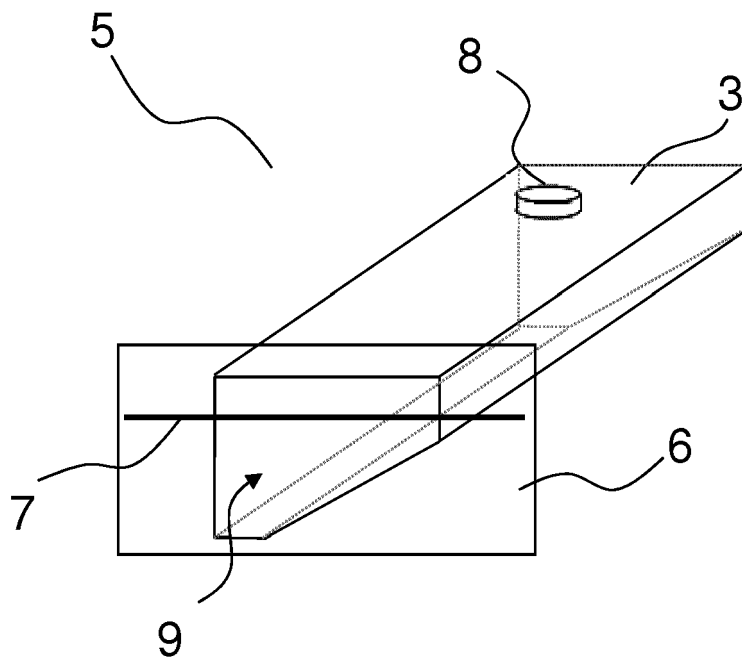


Fig. 3

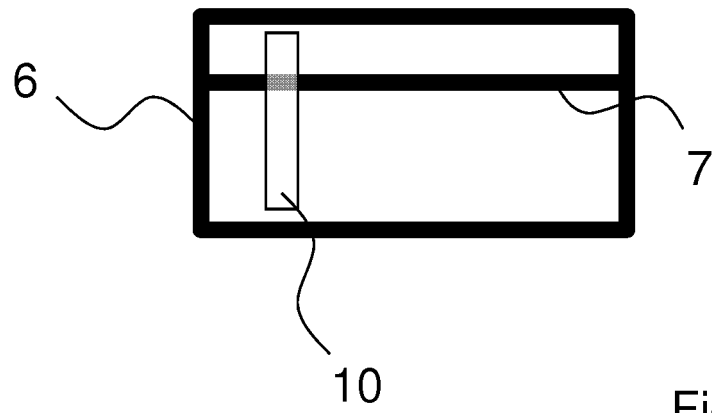


Fig. 4

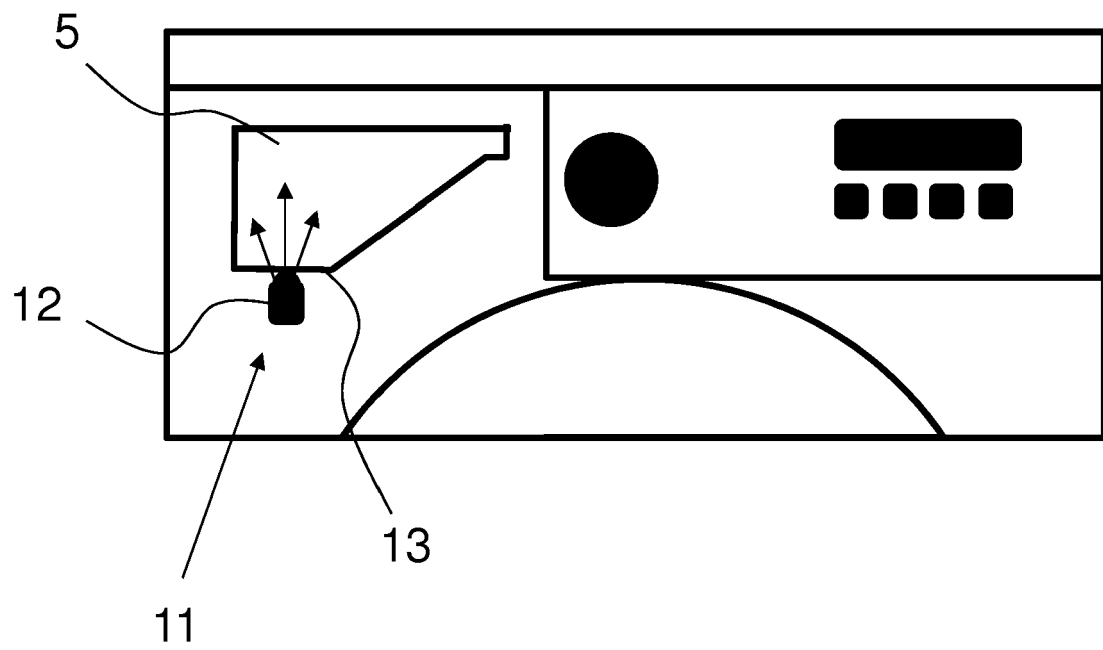
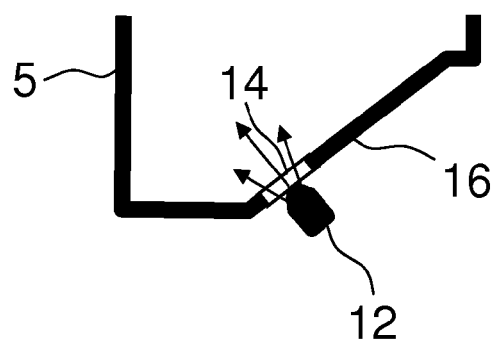
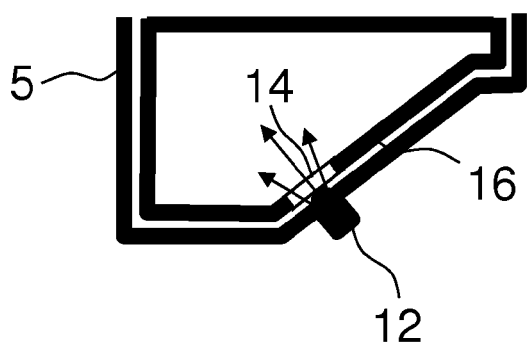
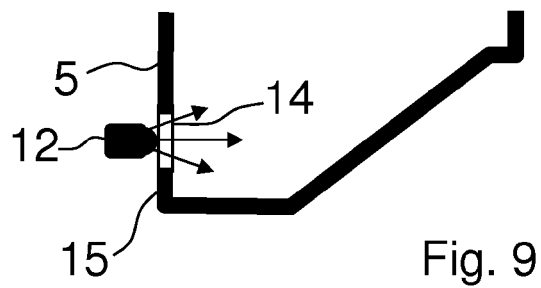
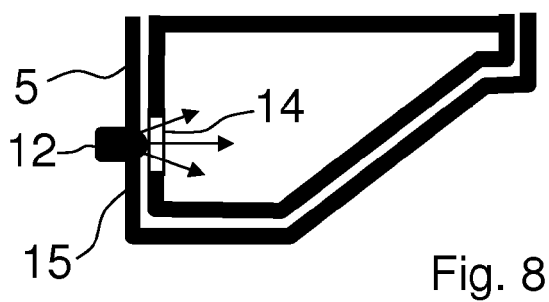
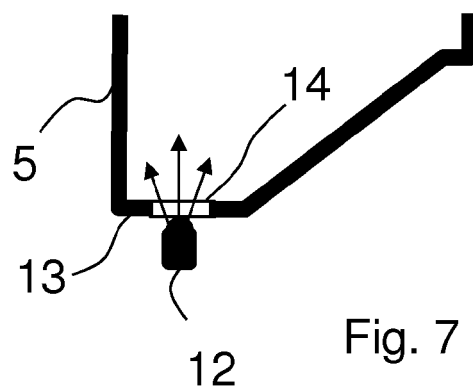
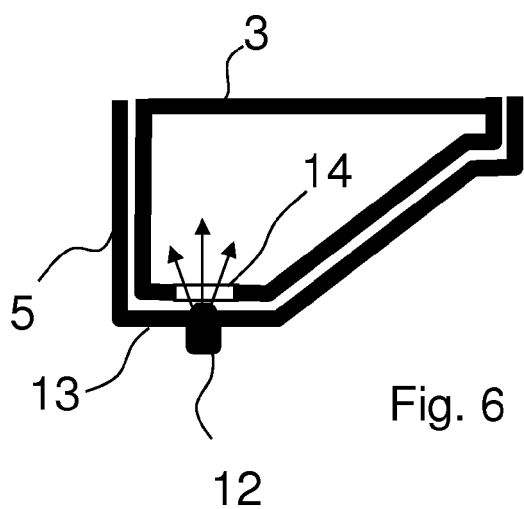


Fig. 5



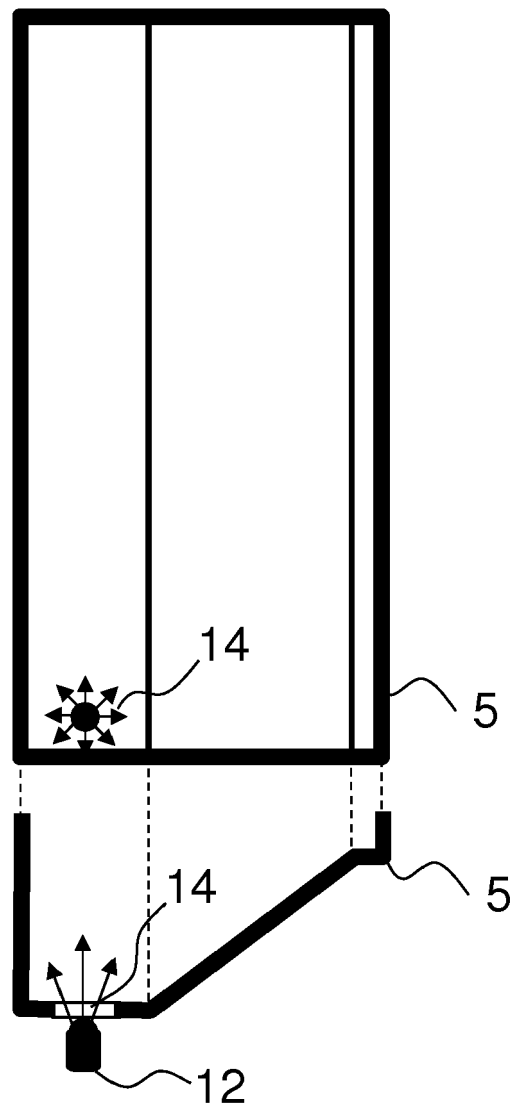


Fig. 12

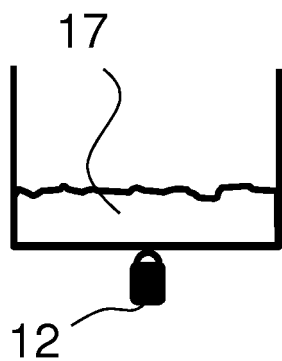


Fig. 13

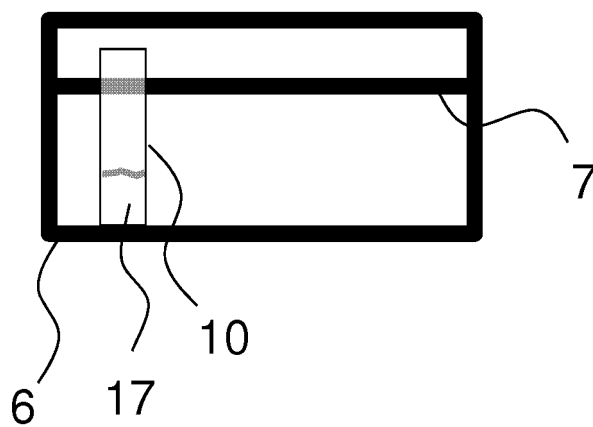


Fig. 14

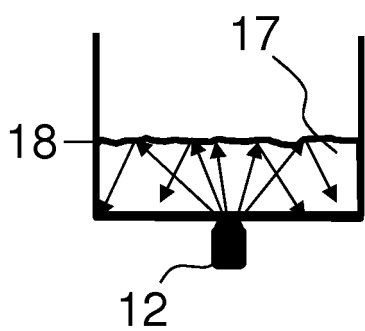


Fig. 15

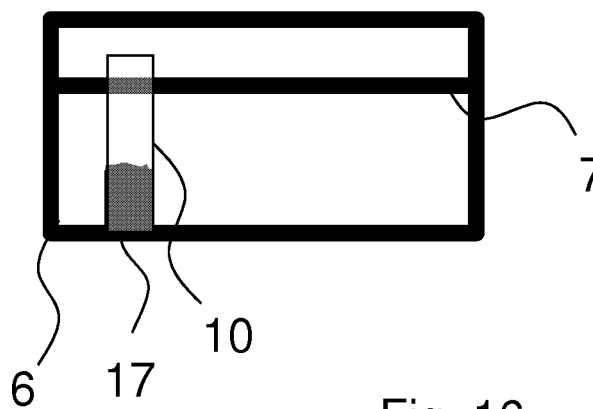


Fig. 16

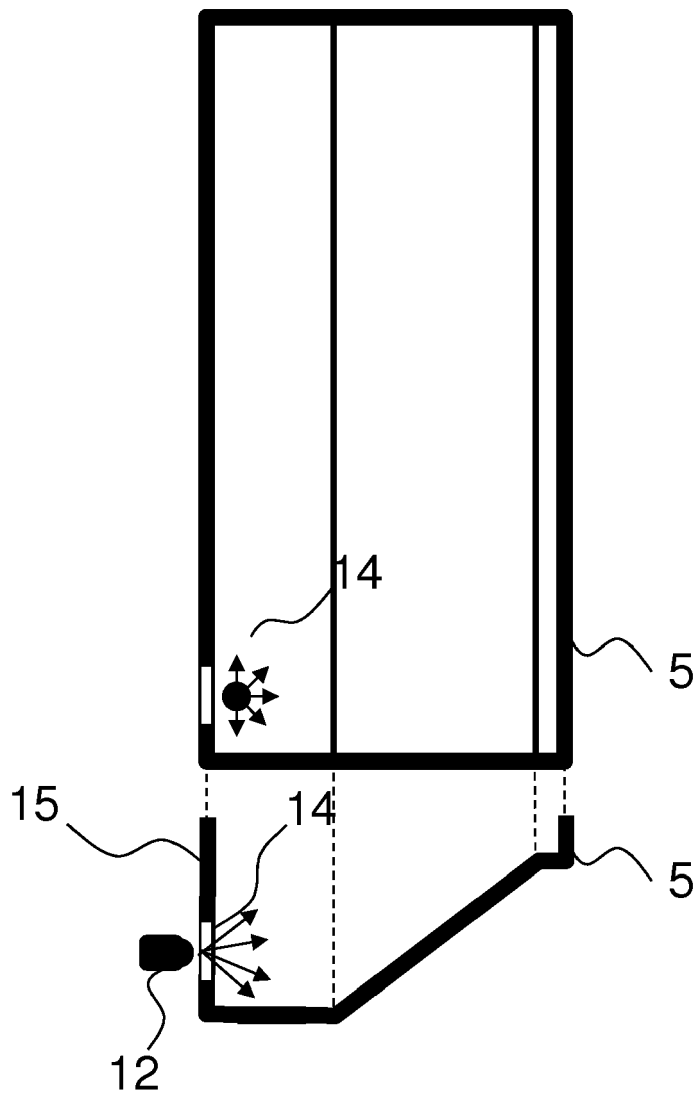


Fig. 17

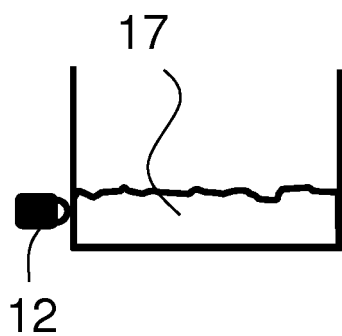


Fig. 18

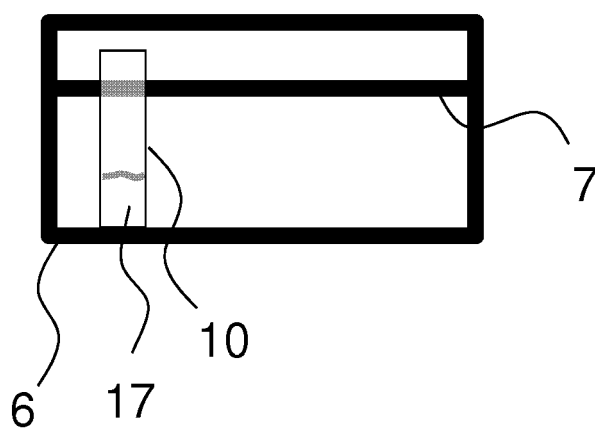


Fig. 19

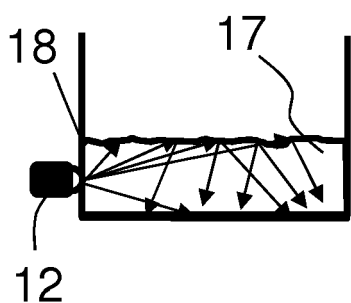


Fig. 20

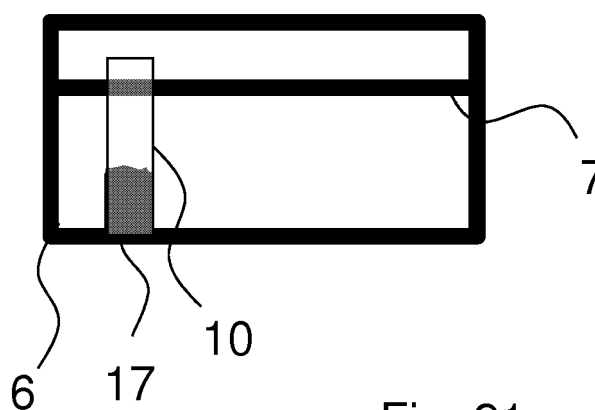


Fig. 21



EUROPEAN SEARCH REPORT

Application Number
EP 12 16 9079

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Y	----- DE 37 08 516 A1 (BOSCH SIEMENS HAUSGERAETE [DE]) 29 September 1988 (1988-09-29) * the whole document *	1-11	
Y	----- WO 2011/012467 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]; KRUEGER MANFRED [DE]; PROPPÉ WOLFG) 3 February 2011 (2011-02-03) * the whole document *	1-11	
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			D06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 August 2012	Examiner Jezierski, Krzysztof
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			

 2
EPO FORM 1503 03.92 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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09-08-2012

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