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DEVICE FOR EXPERIENCING A VIRTUAL REALITY SIMULATION IN AN UNDERWATER WORLD

The present invention relates to a device for a user for experiencing a virtual reality simulation, which makes it possible to experience a simulated, extended underwater world in a visually and sensorially believable manner.

Virtual reality simulations are known from the prior art in a variety of forms and are for example used to depict a virtual reality during a journey with a rollercoaster on a VR-display device or a head-mounted-display to be put on by a passenger.

From EP 3 188 482 A1 is already known a device for generating and representing a virtual reality simulation with a VR-display device, wherein for representing the virtual reality simulation, contents are projected from the outside onto an outer wall of a reservoir. A swimmer or a passenger wears a pair of glasses with a liquid crystal closure, which alternately in accordance with the projection blocks the field of view of the right or left eye of the swimmer in order to create the impression of a stereographic representation.

In contrast, in the case of a head-mounted-display, the image of the optical reality in the actual field of view of the passenger is replaced by means of the head-mounted display by the stereoscopic representation of a virtual reality. Here, the representation of the virtual reality is adapted, depending on the position and/or alignment of the head-mounted-display, synchronously with the head movement of the passenger in real time. Also, the optical reality can be captured by a camera and be extended in the representation of the head-mounted display by introducing augmented-reality effects.

In these known carnival rides, in which the passenger wears a head-mounted-display during the journey and on which a virtual reality, synchronised with the journey, of the journey or of the rollercoaster journey, is displayed to the passenger, the head-mounted display is typically connected with a data processing apparatus which creates the virtual reality simulation.

From the prior art, head-mounted-displays are previously known which are watertight and can be used for applications underwater. Virtual reality head-mounted-displays of this sort are used to present a simulated underwater world to a user. The free swimming around on the part of the user within an underwater world, for example in a water tank, is always accompanied with the danger that the user collides with the walls of the water tank. The position of the virtual reality head-mounted-display must be

continuously detected in order to make visible in the virtual reality for the user the position of such obstacles of the optical reality, and therewith to prevent a collision. A position determination of this sort under water is possible only to a certain extent for reasons of the higher optical density. In addition, the freedom of movement in a water tank of this sort is frequently limited, for which reason even when using a position determination, a user is able to experience only a limited freedom of movement, as a result of which the simulated experience of an extended underwater world is not a satisfying experience.

For this reason, it is the task of the present invention to make available an apparatus for a user for experiencing a simulated, extended underwater world, which represents a virtual reality to the user by means of a VR display device and at the same time, depending on the virtual reality, offers the tactile perception of water movements, significantly by means of the feeling of a current or of the water resistance and the mimicking of an unlimited freedom of movement, offers a particularly exciting experience. In this regard, as far as possible all senses of the user should be stimulated in order to make the experience as real as possible, in order to achieve a degree of immersion which is as high as possible.

These tasks are solved by a device with the features of claim 1. Advantageous further developments are subject matter of the dependent claims.

The apparatus according to the invention for at least one user comprises at least one water reservoir with at least one current generator, which is configured to create a relative movement in the water reservoir between the user and the water arranged in the water reservoir. In addition, the apparatus comprises at least one data processing device and at least one VR display device, wherein the data processing device creates a virtual reality simulation which is reproduced visually on the VR display device. The at least one current generator can here be controlled either directly by the at least one data processing device depending on the at least one virtual reality simulation or also, according to the invention, can generate a current synchronised to the at least one virtual reality simulation, as a result of which relative movements, depending on the simulation, are generated between the water of the water reservoir and the at least one user. By means of the different relative movements, the at least one user perceives a movement in the water reservoir for reason of the water resistance, as a result of which an underwater world can be experienced which is particularly believable for him. The data

processing device and the current generator are here operated such that the virtual reality displayed on the VR display device is synchronised with the relative movement in the water reservoir.

5 Here, it is especially advantageous when the water reservoir is a pool, a lake, a sea or river. The apparatus according to the invention can thus be used in a versatile manner in any water body, on condition that it has a sufficient size. A sufficient size is always given when the user has sufficient freedom of movement in all three spatial directions. Water tanks, particularly swimming pools, are especially preferred.

10 According to a further advantageous embodiment of the invention, it is provided that the current generator is a pump, a turbine, a cable winch and/or a water craft, in particular an underwater craft. The pump or water turbine are configured to generate one or a plurality of currents locally in the water reservoir, while a cable winch, a water craft and/or an underwater craft draws the user through the water reservoir. A combination of different current generators is possible.

15 It is furthermore advantageous when at least one input device is provided for the at least one user, which is connected with the data processing device. By means of the input device, the user can influence the virtual reality simulation. For example, the input device can have a button for starting and stopping the virtual reality simulation or a rotating knob which is configured analogously to a throttle twist of a motorcycle and alters
20 the speed with which the user moves through the virtual reality world.

The input device can be wired or connected wirelessly with the data processing device. Wired connections are particularly preferred, since the range of wireless transmission is limited for reason of the higher optical density of the electromagnetic waves in water. Wireless connections can however be designed for short ranges, for
25 example in the form of Bluetooth or Wlan connection.

According to a further preferred embodiment of the present invention, at least one holding device is provided in the water reservoir, by means of which the at least one user is held in a position relative to the at least one current generator. By means of the holding device, the user is supposed to remain stationary in relation to the current generator,
30 such that there is no danger of him drifting away in an uncontrolled manner and impacting on the edge of the water reservoir.

The holding device can for example be configured in the form of a shark protection cage which protects the user from predatory fish attacks in the VR world.

A further possible design of the holding device is an imitation of an underwater scooter. The input devices can be provided at appropriate positions on the handles of the underwater scooter analogously to fully functional underwater scooters, by means of which a very natural experience and an intuitive operation are facilitated.

5 Furthermore, the holding device can be formed by a rod and/or of ropes, by means of which the user is held.

 Furthermore, however, it is particularly advantageous when the holding device has a movement device by means of which the holding device can be moved. The movement device can for example on the one hand be used to lift the holding device in the form of
10 a shark protection cage together with the user in the water reservoir, and on the other hand the movement device or a further movement device can generate shakings and movements on the holding device. A collision, simulated in the VR world, with a predatory fish can be made discernible by a synchronous shaking of the shark protection cage generated by the movement device.

15 The movement device can hold the holding device in position preferably by means of ropes. For embarking and disembarking, the ropes can be adjusted by the movement device such that the holding device surfaces and the user can climb out of the water without problem from there. Especially preferably, a movement device of this sort is used in connection with an underwater scooter. Attacks by predatory fish, collisions or similar
20 can also in the same way be simulated by means of the movement device and the underwater scooter as a holding device, and vibrations and movements can be able to be experienced in a manner which is tactile for the user.

 According to the invention, it is in addition provided that the holding device encloses the at least one input device and/or the at least one current generator. The
25 holding device can thus on the one hand generate a current which is discernible for the user and on the other hand the user can influence the speed of the VR world by means of the holding device. With an integration of the current generator into the holding device, the distance between the user and the current generator is reduced to the bare minimum. Thus, the quantity of the mass flow of water moved through the current generator can be
30 reduced and on the other hand a change in the generated current is discernible for the user after a slight delay.

 In addition, the holding device can have sensors by means of which the current resistance or the propulsion of the user is detected.

For example, the user can exert a force on the holding device by means of generating their own propulsion. This propulsion force of the user is detected and the speed of movement in the VR world, as well as the current generated by the current generator, is intensified, and vice versa. Thereby, the user can prescribe the speed through the VR world by means of swimming movements or diving movements. The sensors can in addition detect steering movements of the user on the holding device and therewith influence the VR experience.

In addition, especially preferably, the sensors can detect pressure or temperature in the current. The sensors can in particular detect the current speed and the current direction, such that the virtual reality simulation can be generated also as a function of the current generated by the current generator.

The VR display device is a water-resistant head-mounted-display. The head-mounted-display can further preferably detect the position and/or the alignment synchronously to the head movement of the user. The head-mounted-display replaces the optical reality in the actual field of vision of the user by a stereoscopic representation of a virtual reality. In a further preferred embodiment of the VR display device, this is equipped with at least one camera which detects the virtual reality.

In addition, the head-mounted-display can have a camera by means of which the optical reality is captured and is extended in the representation of the head-mounted-display by adding-in augmented-reality effects.

The VR display device can here be wired or connected wirelessly with the data processing device.

According to a further preferred embodiment of the present invention, the current generator comprises the admixing of warm or cold water. By means of the admixture of warm and cold water, different water layers can be simulated. Alternatively to the admixing of warm or cold water, appropriate coolers or heaters can be provided.

Furthermore, it is especially advantageous when at least two current generators are provided that can generate a water current in different directions and/or at different speeds. Thus, in particular shear currents such as whirlpools or similar can be simulated.

Furthermore, it is especially advantageous when the at least one current generator has a current vector control by means of which the direction vector of the current in relation to the user can be altered.

According to a further preferred embodiment of the present invention, at least one sound source is disposed in the water reservoir, which is capable of emitting sounds depending on the virtual reality simulation. By means of the sound source, sounds can be emitted from the VR world, such as for example passing motorboats, biting noises of the predatory fishes on the shark protection cage, or similar.

In a further preferred embodiment of the present invention, at least one air bubble generator is provided which is operated depending on the virtual reality simulation. The air bubble generator generates one or a plurality of differently large air bubbles which interact with the user in the case of contact. The air bubbles change locally the buoyancy of the human body, such that in this manner a discernible force is exerted on the user with the air bubbles. Also, the air bubbles can contain heated or cooled air, which generates a special sensory experience.

Further preferably, at least one position detection device is provided by means of which the position of the at least one user is detected. The position detection device is here capable of detecting not only the position of the user but for example also their gestures and/or posture. If a plurality of users use the device at the same time, the users can interact with one another in the virtual reality and thereby explore the VR world together and interact also in the VR world by means of gestures.

A further advantageous further development of the present invention provides that an introduction means is provided by means of which at least one object can be introduced into the water reservoir. Objects of this sort are for example swimming or diving bodies such as balls, rubber fish or similar. The objects can be furnished with a surface coating which has a surface haptic adapted to the skin of a fish. In addition, the objects can be represented in the VR world. The object or objects can also be imitated by an operator, who to this end puts on a diving suit with appropriate surface haptic.

Objects can also be arranged in the water reservoir so as to be movable by means of an actuator. Controlled by means of the actuator, the objects can be guided to or against the user and interact with them physically or also in the VR world.

The objects can imitate water creatures, water plants or other underwater objects such as stones, rocks, wrecked parts, or can be imitations of real objects.

In addition, it is especially advantageous when the data processing device contains a multiplicity of virtual reality simulations with different experiences. The user can experience one experience or several experiences one after another in a targeted manner,

also, by means of a user interface, specific preferences or dislikes can be taken into consideration when designing the experience.

Advantageously, a plurality of users of the device can experience an individual virtual reality simulation.

5 The invention will be described in detail hereinafter on the basis of embodiment examples with reference to the attached figures.

Figure 1 shows a schematic representation of a device according to the invention consisting of a current generator, which generates a current in a water reservoir in which a user is situated, to whom a VR world is represented by means of a VR display device,

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figure 2 shows a second embodiment example according to the invention of the present invention, wherein the user is held in a fixed location in relation to the current generator by a belt-like holding device,

figure 3 shows a third embodiment example according to the invention having a holding device which is in the form of a diving scooter and has a current generator,

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figure 4 shows a fourth embodiment example according to the invention of a device according to the invention having a multiplicity of current generators and holding devices which facilitate a VR underwater experience for a multiplicity of users, and

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figure 5 shows a fifth embodiment example according to the invention with a holding device which is in the form of a shark protection cage, two current generators and one object, which is movable in the water reservoir by means of a moving device and which can interact with the user.

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Hereinafter, different embodiment examples of the invention will be described in detail with reference to figures 1 to 5. Identical or functionally identical parts are labelled with the same reference signs.

Figure 1 shows in a strongly schematised representation a device 1 according to the invention, which permits a user 2 to be able to experience a simulated extended underwater world in an especially believable manner.

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The device 1 comprises a (not shown) data processing device, which calculates or generates the virtually reality simulation on the basis of a computer program. This device-

specific computer program serves to simulate a virtual reality of an underwater world during a dive, wherein the virtual reality is represented to the user on a VR display device 40 and is imitated such as to be able to be experienced in an especially believable manner by means of further technical aids, as will be described in more detail hereinafter.

5 Furthermore, the device 1 comprises a water reservoir 10 which is filled with water. In the present embodiment, the water reservoir 10 is a pool 11, which is dimensioned so as to be sufficiently large for the user 2 to be able to move freely in all three spatial directions without colliding with the walls 12 of the pool 11. The water in the water reservoir 10 is preferably freshwater, wherein also saltwater can be used without
10 problem.

 At a wall 12 of the water reservoir 11 is arranged a current generator 20 which is configured to generate a current 21. The current 21 flows through the water reservoir 10 as a free jet and is configured to flow around the user. The current generator 20 is configured analogously to a counter-current system, wherein the operating point is set by
15 the data processing device as a function of the virtual reality simulation and is thereby dynamically variable. A corresponding pump for water turbine draws the water required for this from a water circuit or from a freshwater supply of the device 1. In this regard, a plurality of current generators 20 can be assigned to one pump.

 Alternatively, the current generator 20 can generate predefined current conditions
20 on the basis of a program with a predetermined current sequence. The current sequence is started together with the virtual reality simulation and it is communicated to the application in the VR display device 40 that the animation is supposed to start. In this alternative embodiment, the virtual reality simulation generated by the data processing device is generated synchronously with the current 21. By detecting current variables, the
25 data processing device can also generate, or generate in a synchronised manner, the virtual reality simulation as a function of the current generators 20.

 In the current 21 of the current generator 20, the user 2 dives down and attempts to swim against the flow by using propulsion movements. In order to prevent a collision with the walls 12, a position detection device is provided which detects the position of
30 the user 2 in the water reservoir 10. The position detection device monitors the position of the user 2 in that the current generator 20 is controlled as a function of position, as a result of which the user is held in a stationary manner. If the user 2 generates more propulsion, he moves in the direction of the current generator 20. The position detection

device detects this and increases the current speed of the current 21, such that the user returns to the original position. The reverse is the case when the user 2 generates a smaller propulsion. The flow speed of the current 21 in the water reservoir 10 is here equal to the speed with which the user 2 moves through a virtual world or VR world generated by the virtual reality simulation. A scaling of the speeds can also be provided. The VR world can for example constitute a dive through a reef.

The user 2 thus determines by means of his own movements with which speed he moves through the VR world. Also, the user 2 can influence the VR experience by means of appropriate changes in the direction of movement.

During the dive, the user 2 is supplied with oxygen for breathing by means of a suitable device, wherein the strand for supplying with breathing air can also be used in the same way for the transmission of data from the VR display device 40.

The VR display device 40 can in addition easily be connected in a wireless manner with the data processing device, wherein, for reasons of the higher optical density of the electromagnetic waves in water, a wireless transmission is possible only over short distances. For the wireless transmission of data between the data processing device and the VR display device 40, long-wave frequencies are preferably used as far as possible. A data transmission via usual standard frequencies in ISM bands can also be used, taking into consideration aforementioned limitations.

From the coupled interplay between the current speed and the VR world displayed by the VR display device 40, an especially high degree of immersion is achieved. On the one hand, the user 2 receives a high-quality experience represented visually, and at the same time perceives the movement below water particularly by feeling the currents, such that the awareness of the user is subjected to illusory stimuli which allow the real world to move into the background, such that the VR world is now perceived to be real.

The experience of the user 2 can be additionally increased in terms of dramaturgy by means of further stimulations of the senses and impressions. In addition, objects 26 can be supplied to the current 21, which are washed against the user with the current 21. In the VR world, these objects 26 can represent water creatures and can make the VR experience even livelier. The objects 26 are preferably rubber elastic solid bodies, in particular balls, the density of which is slightly smaller than the density of the water in the water reservoir 10. As a result, the objects 26 do not surface directly in the current 21,

but rather follow it, interact with the user 2 and subsequently slowly surface. The surfaces of the objects 26 imitate in each case the animals shown in the VR world.

Additionally to this, one or a plurality of sound sources can be arranged in the water reservoir 10, by means of which for example typical sea noises can be played. By means of an appropriate arrangement of the sound sources, in connection with a visual representation on the part of the VR display device 40, a close passing of a motor boat can be simulated.

Also, air bubble generators can be arranged in the water reservoir 10, which produce air bubbles in a targeted manner which interact with the user 2.

The penetration into different water layers, in particular the diving into deeper waters, can be imitated by an admixture of cold water. The human body has especially many thermoreceptors in the region of the face and on the hands which are able to feel even small temperature changes. Thus, slight temperature changes of approximately $>0.25^{\circ}\text{C}$ suffice.

The second embodiment example according to the invention, shown in figure 2, differs in the type of the positioning of the user 2 in front of the current generator 20. The positioning of the user 2 is simplified inasmuch as they do not need to effect the positioning in the current 21 by means of their own bodily force, but rather a holding device 60 assumes this task. The holding device 60 grips around the user 2 with a belt and holds them by means of ropes 61 in a stationary manner in a predetermined position in front of the current generator 20. The belt is preferably arranged in the region of the hip or at the centre of gravity of the body and prevents the user from being washed away. By means of the holding device 60, thus a sustained current experience can be facilitated without the user needing to hold on anywhere.

The holding device 60 consists furthermore of a movement device 65 by means of which the user 2 can be moved relative to the current generator 20. A movement of this sort is for example necessary at each start and each end of the virtual experience, in order to move the user 2 from the poolside into the appropriate position in front of the current generator 20.

The data processing device controls the current generator 20, the movement device 65 and generates the virtual reality simulation which is shown on the VR display device 40.

A third embodiment example according to the invention can be seen from figure 3, wherein identical or functionally identical parts are described with the same reference signs as in the previous embodiment examples. The device 1 contains for each user 2 a current generator 20, a holding device 60 or an underwater scooter 25, and a VR display device 40. The current 21 can also be generated for all users 2 by a common current generator 20.

The holding device 60 imitates an underwater scooter 25 and is held on a frame 62 by means of ropes 61. The holding device 60 has movement devices 65, analogously to the embodiment example presented in figure 2, wherein each of the ropes 61 can be moved to the movement device 65 with a movement.

The holding device 60 or the underwater scooter 25 can be driven to the poolside at the beginning of a journey and at the end of the journey by means of the movement device 65, so that the user 2 can mount or dismount. The holding device 60 comprises two bracket-like handles 66 which the user 2 can hold onto and which protrude from the holding device 60. On the handles 66 is provided at least one input device 50, by means of which the user 2 can start and end the ride or the experience.

In addition, a second input device 50 is provided on the handle 66 which is in the form of a throttle twist and by means of which the user 2 can set the speed with which he floats through the VR world. The throttle twist here imitates a throttle twist on a handle of a motorcycle.

In the holding device 60 is arranged a current generator 20. The current generator 20 generates a current 21 which emerges on a side, facing the user 2, of the holding device 60 and flows around the user 2. The holding device 60 or the underwater scooter 25 is preferably cylindrically shaped or designed in the manner of a torpedo and the current generator 20 is arranged in the interior of the holding device 60. The voltage supply and the data connections to the data processing device can be effected with wires along the ropes 61.

In addition, still further current generators 20 can be arranged in the water reservoir 10, such that on the one hand a diving speed is tangible for the user 2 and on the other hand a trail from the underwater scooter 25 or from the current generator 20 can be felt in the underwater scooter 25.

The holding device 60 can also have sensors by means of which the exertion of force of the user 2 on the holding device 60 is detected. The user 2 can influence the direction

of travel in the VR world by means of steering movements on the holding device 60. The sensors detect the steering movements of the user 2, as a result of which the appropriate changes in direction in the VR world take place.

5 The ropes 61 of the holding device 60 can in addition establish a voltage supply and/or data connection between the holding device 60 or the underwater scooter 25, the current generator 20, the sensors and the VR display device 40, and the data processing device.

10 By means of suitable measurement technology, the sensors can also record the current 21 metrologically. Pressure and temperature sensors can be provided to capture the current 21, in particular current speed and current direction. By means of the measurement value or values detected by the sensors, the virtual reality simulation can be generated by the data processing device as a function of the actually present current speed.

15 The position detection device observes the user 2 during the experience. By means of the position detection device, for example, hectic movements or a restless behaviour of the user 2 can be detected. Hectic foot movements or hand movements can for example stir up sediments in the VR world or frighten water creatures.

20 From figure 4 can be learned the device 1 with a multiplicity of holding devices for a plurality of users 2. The holding devices 60 are arranged in a stationary manner at the wall 12 of the pool 11 and formed in the manner of an underwater scooter 25. Each of the users 2 has their own VR display device 40, wherein either each user 2 can experience an individual experience or the users 2 can experience a common experience in the VR world. To each holding device 60 is assigned a current generator 20, such that also in the common VR world each user 2 is able to influence the experience individually by means of appropriate inputs by means of the input device 50 or the sensors.

25 Here, the position detection device can detect each single user 2 and represent them appropriately in the VR world of the remaining users 2, such that for example a communication by means of gestures between the individual users in the VR world is possible during the experience.

30 In figure 5 is depicted a fifth embodiment example. The holding device 60 is designed as a shark protection cage 67 in which the user 2 is situated.

The device 1 according to this embodiment example facilitates an especially exciting VR experience, that is cage diving with sharks. The device 1 is here particularly

compact and mobile and can as a result be used at different locations, such as for example a mobile ride.

5 This VR experience can begin already prior to the actual submerging of the user into the water reservoir 10. The movement device 65 is for example designed in the form of a crane which moves the shark protection cage 67 from a boat into the water reservoir 10 at a predefined position in front of the current generator 20.

10 In the underwater world, a current is simulated by the two current generators 20. In addition, an object 26 is held moveably in the water reservoir 10 by means of a control unit 27. The object 26 can be moved by the control unit 27 relative to the holding device 60.

15 The movements of the object 26 are represented to the user 2 in the VR world by the VR display device 40, corresponding to the virtual reality simulation generated by the data processing device, while the user 2 senses by means of different current resistance that the object 26 is swimming past. Also, a collision of the object 26 with the holding device 60 can be simulated, in order to simulate an attack by a predatory fish. Synchronously with this, the movement device 65 can set the holding device 60 into an appropriate shaking and/or vibration and the sound source can generate an appropriate level of sound. This haptic experience is represented visually in the VR display device 40 or in the VR world.

20 For extended simulation, particularly of shear currents, fin impacts of the water dwellers etc., the current generator can have a vector control means by means of which the current vectors can be freely set. The occurrences in the VR application 40 can thus be simulated by individual or synchronised controlling of one or several current generators 20.

25 The technical teaching according to the invention is not limited to the individual embodiments in the concrete embodiment examples. On the contrary, combinations of the individual embodiment examples are possible.

30 Thus, according to the invention, a device 1 can be provided for experiencing a virtual reality simulation in an underwater world 1, which in a versatile manner generates a number of sense experiences which is as great as possible, which facilitates for the user 2 a believable simulated experience in the underwater world.

List of reference signs

	1	device
	2	user
5	10	water reservoir
	11	pool
	12	wall of 11
	20	current generator
	25	underwater scooter
10	26	object
	27	control unit
	40	VR display device
	50	input device
	60	holding device
15	61	rope
	62	frame
	65	movement device
	66	handle
	67	shark protection cage

Patentkrav

1. Indretning (1) til mindst en bruger (2) til oplevelse af mindst en virtual reality-simulering i en undervandsverden, omfattende:

- mindst et vandreservoir (10) med mindst en strømningsgenerator (20),
- 5 - mindst et databehandlingsanlæg, og
- mindst en VR-skærmenhed (40),
- hvor det mindst ene databehandlingsanlæg genererer mindst en virtual reality-simulering,
- 10 - hvor den mindst ene strømningsgenerator (20) og det mindst ene databehandlingsanlæg til virtual reality-simulering er synkroniseret, og en strømning, synkroniseret med den mindst ene virtual reality-simulering, genereres, hvorved simuleringsafhængige relative bevægelser genereres mellem vandet i vandreservoiret og den mindst ene bruger,
- hvor virtual reality-simuleringen gengives på VR-skærmenheden (40), og
- 15 - hvor VR-skærmenheden (40) er et vandkompatibelt head-mounted display, og den mindst ene VR-skærmenhed (40) er kabelforbundet eller trådløst forbundet med databehandlingsanlægget.

2. Indretning (1) ifølge krav 1, **kendetegnet ved, at** vandreservoiret (10) er et
20 vandbassin (11), en sø, et hav eller en flod.

3. Indretning (1) ifølge krav 1 eller 2, **kendetegnet ved, at** strømningsgeneratoren (20) er en pumpe, en turbine, et wirespil og/eller et vandfartøj, især, et undervandsfartøj.

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4. Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt mindst en holdeindretning (60) i vandreservoiret (10), via hvilken den mindst ene bruger (2) er holdt i en position i forhold til den mindst ene strømningsgenerator (20).

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5. Indretning (1) ifølge krav 4, **kendetegnet ved, at** holdeindretningen (60) omfatter mindst en bevægelsesanordning (65), via hvilken den mindst ene holdeindretning (60) kan bevæges i forhold til vandreservoiret (10).

5 **6.** Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt mindst en indlæsningsenhed (50) for den mindst ene bruger (2), hvilken er forbundet med databehandlingsanlægget, at virtual reality-simuleringen er styret via den mindst ene indlæsningsenhed (50), og at den mindst ene indlæsningsenhed (50) er kabelforbundet eller trådløst forbundet med
10 databehandlingsanlægget.

7. Indretning (1) ifølge et af de foregående krav 4 til 6, **kendetegnet ved, at** holdeindretningen (60) omfatter den mindst ene indlæsningsenhed (50), mindst et sensorsystem, mindst en svingningsgenerator og/eller den mindst ene
15 strømninggenerator (20).

8. Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** strømningsgeneratoren (20) omfatter en blanding af varmt og/eller koldt vand.

20 **9.** Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt mindst to strømningsgeneratorer (20), som kan generere en vandstrøm i forskellige retninger og med forskellige hastigheder, og/eller at mindst en vandstrømningsgenerator (20) omfatter en strømningsvektor-styreenhed.

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10. Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** mindst en lydkilde er anbragt i vandreservoiret (10), og at lyde gengives af lydkilden afhængigt af virtual reality-simuleringen.

30 **11.** Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt mindst en luftboblegenerator, og at luftboblegeneratoren genererer luftbobler afhængigt af virtual reality-simuleringen.

12. Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt mindst en positionsdetekteringsanordning, som detekterer positionen af den mindst ene bruger (2).

5 **13.** Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** mindst en genstand (26) er anbragt i vandreservoiret (10), og/eller at der er tilvejebragt mindst en tilførselsanordning, gennem hvilken en genstand (26) tilføres til vandreservoiret (10).

10 **14.** Indretning (1) ifølge krav 13, **kendetegnet ved, at** der er tilvejebragt mindst en justeringsenhed (27), og at den mindst ene justeringsenhed (27) bevæger den mindst ene genstand (26).

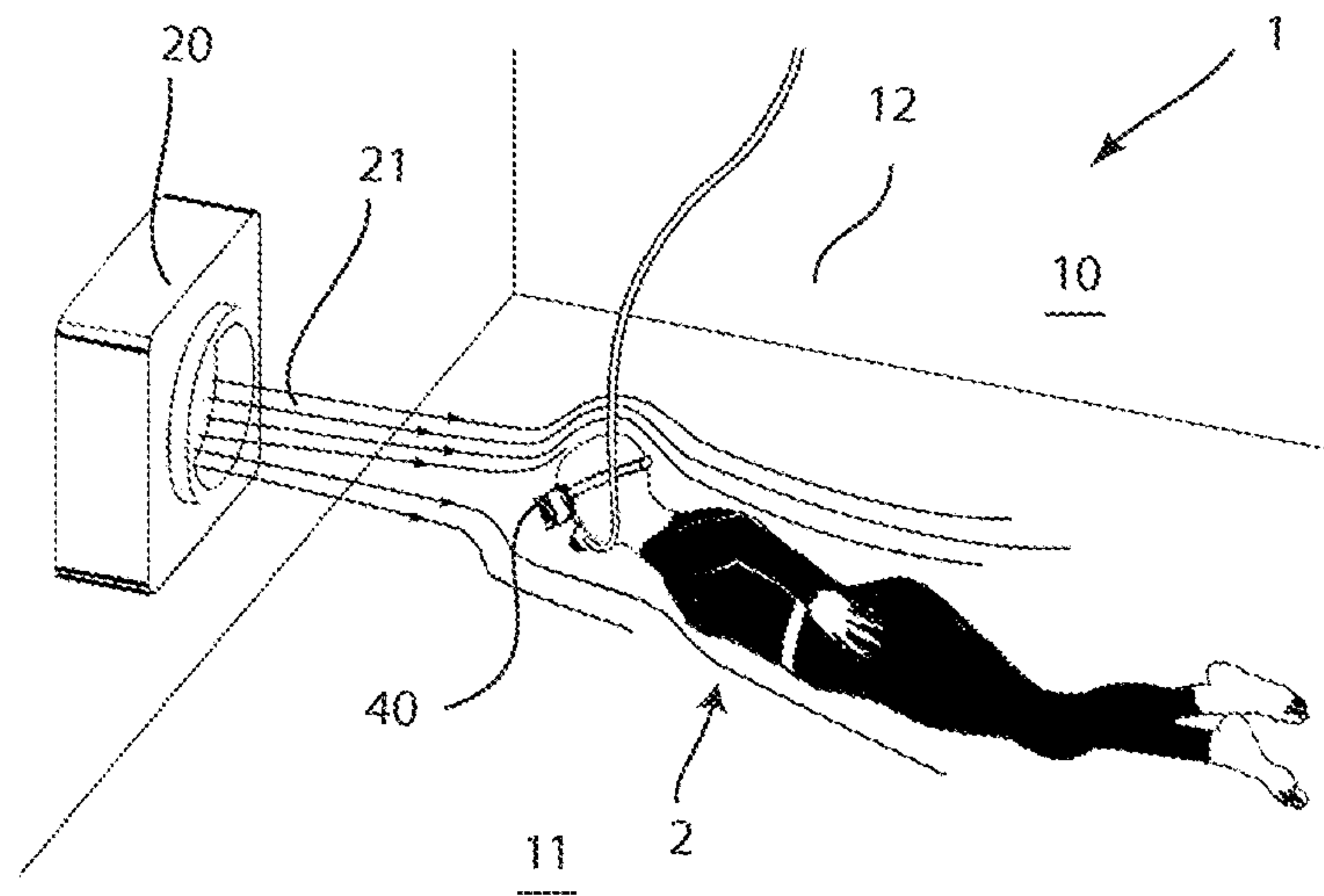
15. Indretning (1) ifølge et af kravene 13 eller 14, **kendetegnet ved, at** den
15 mindst ene genstand (26) er en komponent af virtual reality-simuleringen.

16. Indretning (1) ifølge et af de foregående krav, **kendetegnet ved, at** databehandlingsanlægget genererer en flerhed af virtual reality-simuleringer, som inkluderer forskellige oplevelser.

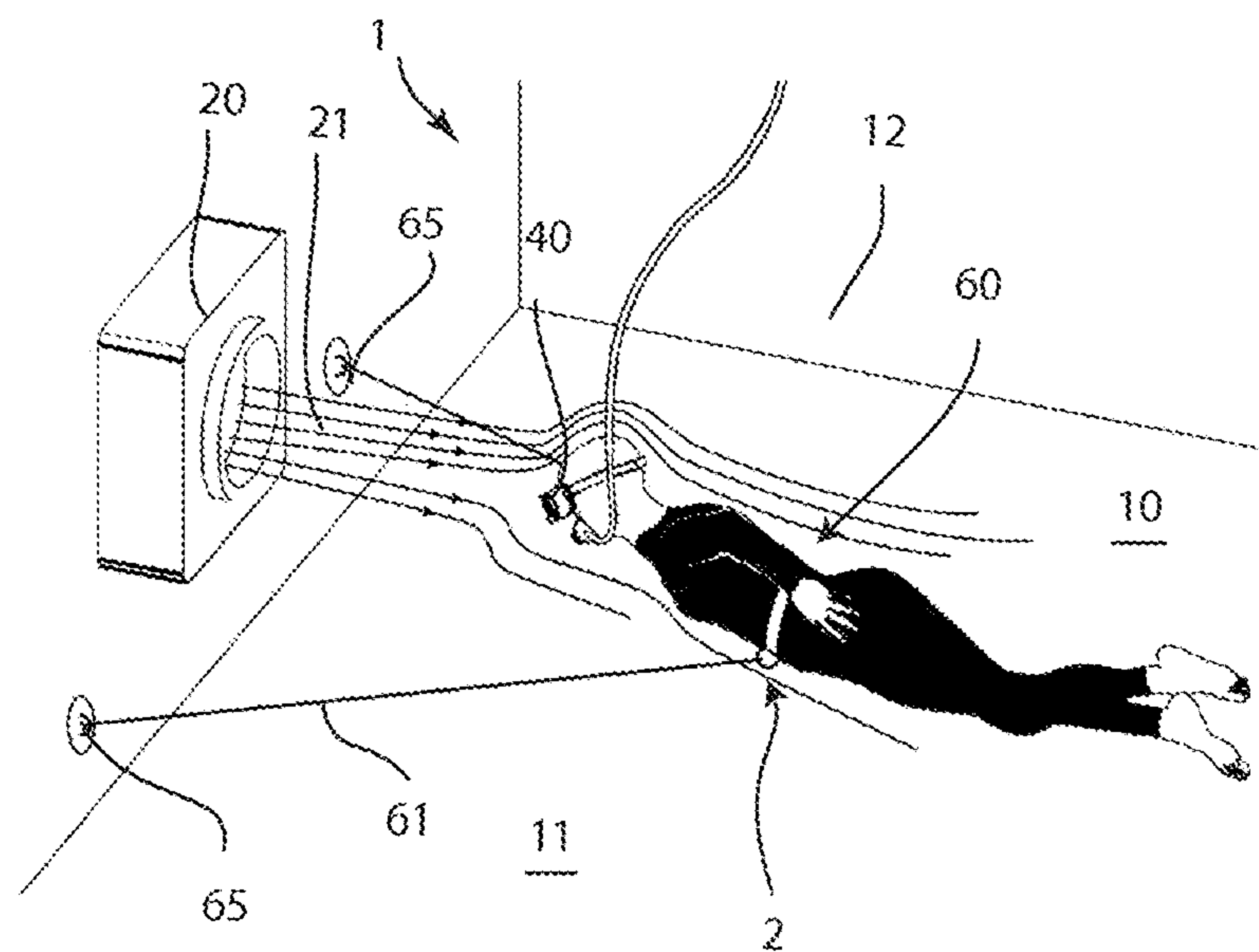
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17. Indretning ifølge et af de foregående krav, **kendetegnet ved, at**, når der er flere brugere (2), kan hver bruger (2) opleve en individuel virtual reality-simulering.

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Figur 1



Figur 2

