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(54) **Device and method for separating and/or washing products with different floating capacity**

(57) The invention relates to a device for separating and/or washing products with different floating capacity, whereby a collector (10) is provided to collect the products with lower floating capacity and whereby the device comprises means to close the fluid reservoir (2) when the products with lower floating capacity are being removed from the collector (10). Said device (1) is provided with a first (5a) and a second valve (5b), said first valve (5a) being in connection with said fluid reservoir (2) and said second valve (5b) being in connection with a removing device, and in between said two valves (5a, 5b) a collector (10) is provided in which the products with the lower floating capacities are collected. Preferably, said two valves (5a, 5b) are membrane valves.

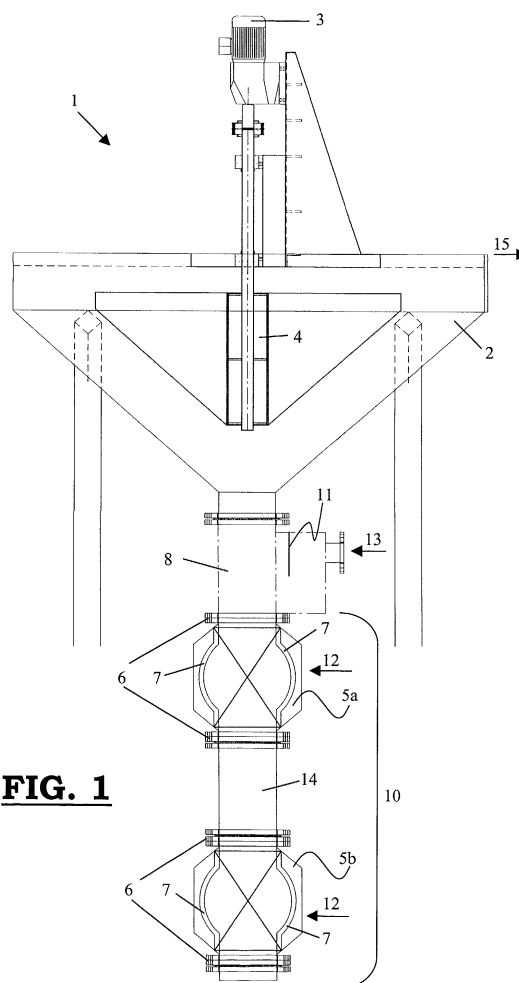


FIG. 1

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Description

[0001] The invention relates in one respect to a device for separating and/or washing products with different floating capacity, comprising a fluid reservoir to introduce the products to be washed and/or separated, and on the other hand to a method for separating and/or washing products with different floating capacity, whereby the products to be washed and/or separated are brought into a fluid reservoir.

[0002] Products with different floating capacity can be divided in products with higher or lower floating capacity, whereby floating capacity is related to the specific gravity of the products in comparison with the specific gravity of the fluid that is used for separating and/or washing products. Products with higher floating capacity have a specific gravity which is smaller than the specific gravity of the fluid, while products with lower floating capacity have a specific gravity which is higher than the specific gravity of the fluid.

[0003] Until now, from BE1010137 is known a method for cleaning products, such as vegetables, fruit, e.d. and a device applying this method. Thereby, products are being collected above an air current, and these products are being influenced by that air current in that way that the light and the heavy parts of the products are being divided. In one way, the products can be brought above the air current through a sloping surface, whereby the movement across this sloping surface takes already care for a removal of unuseful parts. On the other hand, the products can arrive in a collecting device from which they are further divided and arrive in the air current. The products are being removed from the device through a conveyer belt.

[0004] An other device that is known for separating and/or washing products with different floating capacity, comprises a collecting device that comprises a motor that stirs in a tub. The products that have to be separated, such as vegetables and stones, are brought into the tub through a conveyer belt. The products to be separated and/or washed are stirred in the tub. The products with lower floating capacity, e.g. the vegetables, are removed at the top of the tub with a conveyer belt, while the products with higher floating capacity, e.g. the stones, sink and are removed through a conveyer belt under the tub.

[0005] The disadvantage of this system is that the products with lower floating capacity such as stones can fall between the conveyer belt when this conveyer belt is worn out. Then, these products fall on the lower leading roll, and this can block the system. A second disadvantage is that this kind of system is difficult to clean, and a third disadvantage is that there is a lot of maintenance because of the bearing that work in water.

[0006] The purpose of the invention is to provide a device for separating and/or washing products with different floating capacity, comprising a fluid reservoir to introduce the products to be washed and/or separated,

which doesn't have abovementioned disadvantages.

[0007] The purpose of the invention is further to provide a method for separating and/or washing products with different floating capacity, whereby the products to be washed and/or separated are brought into a fluid reservoir, which doesn't show abovementioned disadvantages.

[0008] On the one hand, this purpose is achieved by providing a device for separating and/or washing products with different floating capacity, comprising a fluid reservoir to introduce the products to be washed and/or separated, but whereby a collection reservoir is provided to collect the products with lower floating capacity, and means to close the fluid reservoir when the products with lower floating capacity are being removed from the collection reservoir.

[0009] In a preferred embodiment of a device according to the invention, said device is provided with a first and a second valve, said first valve being in connection with said fluid reservoir and said second valve being in connection with a removing device, and that in between said two valves a collector is provided in which the products with the lower floating capacities are collected.

In a more preferred embodiment of a device according to the invention, said two valves are membrane valves.

[0010] In a specific embodiment of a device according to the invention, said membrane valves can be opened and closed off by means of compressed air.

[0011] In a more specific preferred embodiment of a device according to the invention, the device comprises a space between the collection reservoir and said first valve which can be filled with fluid and in which an upward force is provided to the fluid in said space to push the products with higher floating capacity upwards in the fluid reservoir.

[0012] In a still more specific preferred embodiment of a device according to the invention, said space comprises a dividing partition to prevent whirling of the fluid in said space.

[0013] On the other hand, the purpose of the invention is achieved by providing a method for separating and/or washing products with different floating capacity, whereby the products to be washed and/or separated are brought into a fluid reservoir, but whereby the products with lower floating capacity are collected in a collection reservoir, and whereby the fluid reservoir is closed when the products with lower floating capacity are being removed from the collection reservoir.

[0014] In a preferred method according to the invention, a device is used as described above.

[0015] The characteristics and distinctive features of this invention are further explained below on the basis of an embodiment example, with reference to the attached drawing. It should be noted that specific aspects of this example are only described as preferred example of what is intended in the scope of the above general specification of the invention, and may in no way be interpreted as a restriction on the scope of the invention

as such and as expressed in the following claims.

[0016] In the attached drawing, *figure 1* shows a side view of a device for separating and/or washing products with different floating capacity.

[0017] A device (1) for separating and/or washing products with different floating capacity according to the invention, as shown in figure 1, consists of a fluid reservoir (2) to introduce the products to be washed and/or separated. The device (1) is preferably used to wash vegetables, e.g. tuberous plants and beans, and to remove the stones from the vegetables.

[0018] A motor (3), which is placed above the fluid reservoir (2), drives a stirrer (4) which stirs the fluid, i.e. water, and the products, i.e. the vegetables and stones, in the fluid reservoir (2). The products with higher floating capacity, i.e. the vegetables, will be situated at the top of the fluid reservoir (2) and are removed at the top (15) of the fluid reservoir (2).

[0019] Under the fluid reservoir (2), a space (8) connects the fluid reservoir with a collector (10). The space (8) can be filled with fluid and in the space (8) is an upward force provided to the fluid to push the products with higher floating capacity upwards in the fluid reservoir (2). In the space (8), a dividing partition (11) is provided to prevent whirling of the fluid, but the fluid still has enough upward force to push the products with the higher floating capacities to the top of the fluid reservoir (2).

[0020] The collector (10) consists of two valves (5a, 5b) which create a lock to remove the products with lower floating capacity. Preferably, two membrane valves are used, but also other valves such as knife valves can be used. The membrane valves (5a, 5b) consists of a flange (6) in which a rubber (7) is situated, and which rubber (7) is closed by means of compressed air (12). Between the two membrane valves (5a, 5b), there is a space (14) in which the products with the lower floating capacities can be collected.

The function of the lock will be hereafter explained. While stirring the fluid and the products, the products with lower floating capacity sink on the lower membrane valve (5b), which is closed at that moment, while the upper membrane valve (5a) is open at that moment. At that moment, also water is passed in the space (8) between the fluid reservoir (2) and the first membrane valve (5a) to push the products with higher floating capacity at the top of the fluid reservoir (2) in order to remove them. The dividing partition (11) prevents whirling of the fluid in the space (8). Thereafter, the upper membrane valve (5a) is closed, while the lower membrane valve (5b) is opened, through which the stones can be removed out of the device (1).

Claims

1. Device for separating and/or washing products with different floating capacity, comprising a fluid reservoir to introduce the products to be washed and/or

separated, **characterised in that** a collector (10) is provided to collect the products with lower floating capacity and that the device comprises means to close the fluid reservoir (2) when the products with lower floating capacity are being removed from the collector (10).

2. Device according to claim 1, **characterised in that** said device (1) is provided with a first (5a) and a second valve (5b), said first valve (5a) being in connection with said fluid reservoir (2) and said second valve (5b) being in connection with a removing device, and that in between said two valves (5a, 5b) a collector (10) is provided in which the products with the lower floating capacities are collected.

3. Device according to one of claims 1 and 2, **characterised in that** said two valves (5a, 5b) are membrane valves.

4. Device according to claim 3, **characterised in that** said membrane valves (5a, 5b) can be opened and closed off by means of compressed air (12).

5. Device according to any one of claims 1 up and to 4, **characterised in that** the device comprises a space (8) between the collection reservoir (2) and said first valve (5a) which can be filled with fluid and in which an upward force is provided to the fluid in said space (8) to push the products with higher floating capacity upwards in the fluid reservoir (2).

6. Device according to any one of claims 1 up to and including 5, **characterised in that** said space (8) comprises a dividing partition (11) to prevent whirling of the fluid in said space (8).

7. Method for separating and/or washing products with different floating capacity, whereby the products to be washed and/or separated are brought into a fluid reservoir (2), **characterised in that** the products with lower floating capacity are collected in a collection reservoir (10), and that the fluid reservoir (2) is closed when the products with lower floating capacity are being removed from the collection reservoir (10).

8. Method according to claim 6, **characterised in that** a device (1) according to one of claims 1 to 6 is used.

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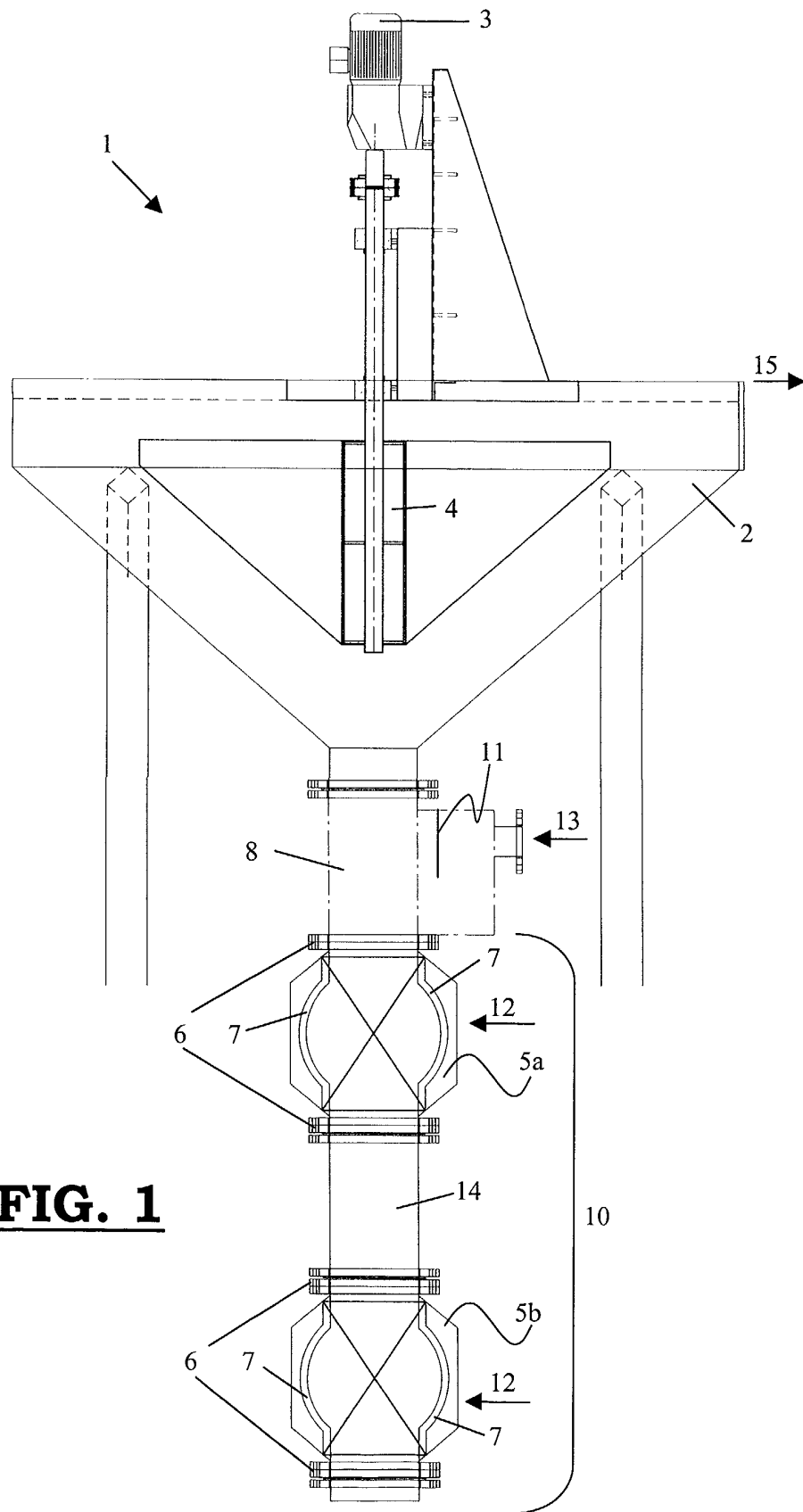


FIG. 1



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EUROPEAN SEARCH REPORT

Application Number
EP 01 20 3791

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
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			TECHNICAL FIELDS SEARCHED (Int.CI.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		26 February 2002	Laval, J
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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26-02-2002

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