operated optimally, because for example work is carried out at the transshipment site only during the day or in extended day shifts. Manually operated transshipment sites are also not able to react well to fluctuations.

Object of the disclosure

It would therefore be desirable to provide a logistics system and a method for the transshipment of at least one fluid medium that at least largely avoid the disadvantages of known logistics systems. In particular, the transshipment should take place automatically, such that the transshipment process is able to be completely automated through automation, and as a result the transshipment site is able to be operated flexibly, sometimes with a high and sometimes with a lower number of mobile tanks to be loaded and unloaded. This also, for the first time, enables safeguarding concepts in which for example half of the products are intended to be transported by one mode of transport, such as for example inland waterway vessel, and the other half are intended to be transported by another mode of transport, such as for example rail. In the event of bottlenecks with one mode of transport, such as for example low water in the case of inland waterway transport, it is thus possible to change flexibly to another mode of transport, which is only possible if, as a result of automation, the loading staff are not the bottleneck.

It would also be desirable to automate loading processes in which the loading staff would be severely harmed in the event of unplanned (unintended) release of the fluid medium resulting from the leakage of the fluid medium. The automation would mean that no people would be in the direct danger zone, and a risk to people could thus be ruled out or reduced.

It would also be desirable to automate loading processes since, in the event of an accident or unintentional release of the fluid medium, the method is suitable for closing the tank even during the emergency measures that have already begun and, optionally, for also having it removed from the danger zone by an automatic transport system, thus reducing the risk or the effects of an accident. By contrast, this is not possible in the case of non-automated loading processes performed by people, as the people would be evacuated first in the event of danger. A mobile tank not involved in the accident/incident could thus be closed by the proposed system and transported out of the danger zone by way of the proposed method. The effects of a possible spread of the accident/incident (for example fire) to the hitherto unaffected mobile tank would thus be avoided, and thus the effects of accidents would thus be reduced, by the proposed disclosure.

General description

This object is addressed by a logistics system and a method for the transshipment of at least one fluid medium having the features as defined herein. Advantageous developments, which may be implemented individually or in any combination, are set forth herein.

In an aspect, there is provided a logistics system (100) for the automatic transshipment of at least one fluid medium, comprising

a. at least one transshipment site (102), wherein the transshipment site (102) is configured to carry out at least one process selected from the group consisting of loading a mobile tank (104) with the fluid medium and unloading the fluid medium from the mobile tank (104), wherein the transshipment site (102) has at least one pipe system (108) having at least one pipe connection (110); and
b. at least one controller (142), wherein the controller (142) is programmed to control at least one function of the logistics system (100); and
c. at least one movement system (112) having at least one movement arm (114) and an automatic coupling system (116), wherein the movement arm (114) is configured to move the coupling system (116), wherein the automatic coupling system (116) is configured to automatically open at least one tank nozzle (118) of the mobile tank (104), wherein the automatic coupling system (116) is furthermore configured to automatically open the pipe connection (110) of the transshipment site (102), and wherein the automatic coupling system (116) is furthermore configured to fluidically connect the tank nozzle (118) and the pipe connection (110).

In another aspect, there is provided a method for the transshipment of at least one fluid medium using at least one logistics system (100) as defined above, wherein the method comprises:

i. bringing the at least one mobile tank (104) to the transshipment site (102);
ii. automatically opening the at least one pipe connection (110) of the transshipment site (102) by way of the automatic coupling system (116);
iii. automatically opening the at least one tank nozzle (118) of the mobile tank (104) by way of the automatic coupling system (116);
iv. establishing at least one fluid connection between the tank nozzle (118) and the pipe connection (110) by way of the automatic coupling system (116); and
v. carrying out at least one process selected from the group consisting of: loading the mobile tank (104) with the fluid medium from the pipe system (108) of the transshipment site (102); unloading the fluid medium from the mobile tank (104) into the pipe system (108) of the transshipment site (102).

In the following, the terms "have", "comprise" or "include" or any grammatical variations thereof are used in a non-exclusive manner. Accordingly, these terms may relate to situations in which there are no further features apart from the features introduced by these terms or to situations in which there is or are one or more further features. For example, the expression "A has B", "A comprises B" or "A includes B" may relate both to the situation in which, apart from

B, there is no further element in A (i.e. to a situation in which A exclusively consists of B) and to the situation in which, in addition to B, there is or are one or more further elements in A, for example element C, elements C and D or even further elements.

It is also pointed out that the terms "at least one" and "one or more" and grammatical variations of these terms, when these are used in connection with one or more elements or features and are intended to express that the element or feature may be provided one or more times, are generally used only once, for example when the feature or element is introduced for the first time. When the feature or element is subsequently mentioned again, the corresponding term "at least one" or "one or more" is generally no longer used, without restricting the possibility that the feature or element may be provided one or more times.

Furthermore, in the following the terms "preferably", "in particular", "for example" or similar terms are used in connection with optional features, without alternative embodiments being restricted thereby. Thus, features that are introduced by these terms are optional features, and there is no intention to restrict the scope of protection of the claims, and in particular of the independent claims, by these features. Thus, as a person skilled in the art will appreciate, the invention may also be carried out using other configurations. In a similar way, features that are introduced by "in an embodiment of the invention" or by "in an example of the invention" are understood as optional features, without it being intended that alternative configurations or the scope of protection of the independent claims are restricted thereby. Furthermore, all the possible combinations of the features thereby introduced with other features, whether optional or non-optional features, shall remain unaffected by these introductory expressions.

In a first aspect of the present invention, what is proposed is a logistics system for the automatic transshipment of at least one fluid medium.

The term "logistics system", as used here, is a broad term that should be attributed its usual and common meaning as understood by a person skilled in the art. The term is not restricted to a specific or adapted meaning. The term may, without restriction, refer in particular to a system that serves to change goods in terms of space, time, type and quantity. Accordingly, a logistics system may comprise a transport, storage and/or picking system in order to carry out this