(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 251 101 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
17.11.2010 Bulletin 2010/46

(51) Int Cl.:
B07C 5/34 *(2006.01)*

(21) Application number: **10162634.9**

(22) Date of filing: **12.05.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **15.05.2009 IT PD20090137**

(71) Applicant: **Acqua Minerale San Benedetto S.P.A.**
30037 Scorze' (IT)

(72) Inventor: **Zoppas, Matteo**
31015 Conegliano Veneto TV (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) **Uprighter with selection, particularly for containers made of plastic, such as bottles and the like**

(57) An uprighter with selection (10), particularly for containers (11) made of plastics, such as bottles and the like, comprising
- a carousel (12) for conveying containers (11),
- at least one sensor (13) for detecting nonconformities of containers (11) conveyed by the carousel (12),
- at least one identifier of the location (A) of a nonconforming container (11a), in the carousel (12), reported by the sensor (13),
- at least one device (14) for expelling containers (11) carried by the carousel (12) in the location (A), indicated by the at least one identifier as the location of a nonconforming container (11a).

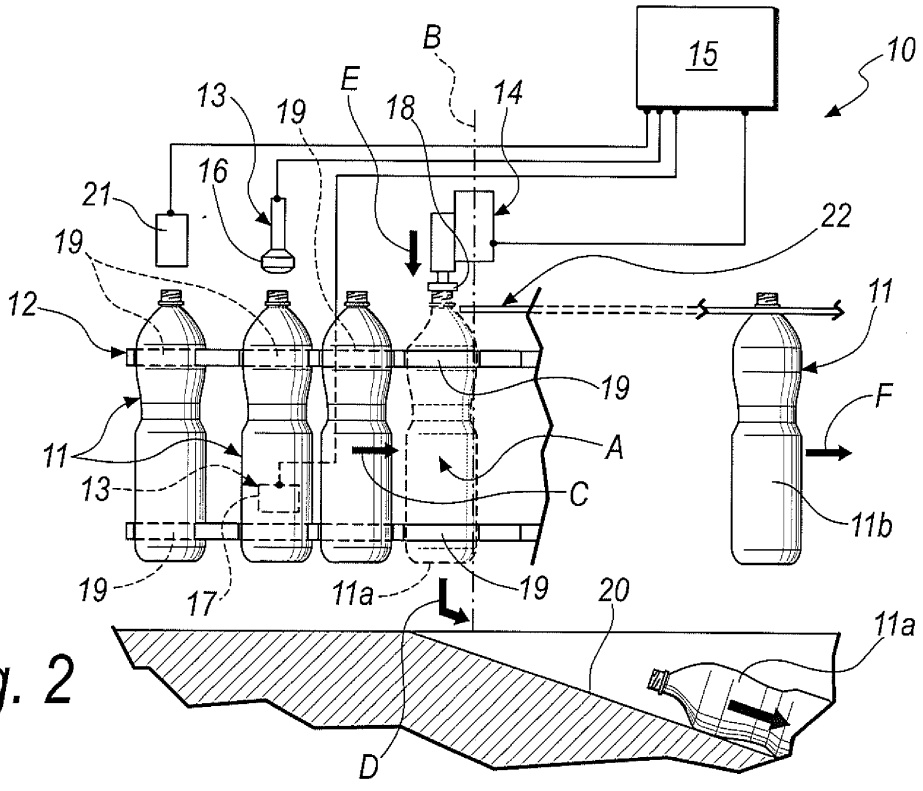

Fig. 2

EP 2 251 101 A2

Description

UPRIGHTER WITH SELECTION, PARTICULARLY FOR CONTAINERS MADE OF PLASTICS, SUCH AS BOTTLES AND THE LIKE

[0001] The present invention relates to an uprighter with selection, particularly for containers made of plastics, such as bottles and the like.

[0002] Currently, in the field of the production of containers made of plastics, and in particular of bottles, the need is particularly felt for efficient and effective automatic verification of the conformity of the products.

[0003] Machines for detecting nonconforming containers, according to predefined shape and size parameters, and for rejecting such containers identified as nonconforming, are currently structurally complicated.

[0004] Moreover, they provide for the rejection of an entire group of containers among which they have identified a nonconforming container, to the full disadvantage of production economy.

[0005] The aim of the present invention is to provide an uprighter with selection, particularly for containers made of plastics, such as bottles and the like, that allows to meet this requirement by allowing to select and reject nonconforming containers.

[0006] Within this aim, an object of the invention is to propose an uprighter with selection that allows to reject in an effectively selective manner only containers that have nonconformities.

[0007] Another object of the invention is to propose an uprighter with selection that is structurally simple and easy to use and can be manufactured with relatively low costs.

[0008] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by an uprighter with selection, particularly for containers made of plastics, such as bottles and the like, comprising a carousel for conveying containers, **characterized in that** it comprises

- at least one sensor for detecting nonconformities of containers conveyed by said carousel,

- at least one identifier of the location of a nonconforming container, in said carousel, reported by said sensor,
- at least one device for expelling containers carried by said carousel in said location, indicated by said at least one identifier as the location of a nonconforming container.

[0009] Further characteristics and advantages of the invention will become better apparent from the following detailed description of a preferred but not exclusive embodiment of the uprighter with selection according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of an uprighter with selection according to the invention;

Figure 2 is a schematic side view of the uprighter with selection according to the invention.

[0010] It is noted that anything found to be already known during the patenting process is understood not to be claimed and to be the subject of a disclaimer.

[0011] With reference to the figures, the reference numeral 10 generally designates an uprighter with selection, particularly for containers made of plastics, such as bottles and the like, which comprises a carousel 12 for conveying containers 11 and comprising

- sensors 13 for detecting nonconformities of the containers 11 conveyed by the carousel 12,
- an identifier of a location A of a nonconforming container 11a, in the carousel 12, reported by the sensor 13, for example provided with, or comprising, a transducer of the angular position of the carousel 12, also commonly known as encoder, which is per se known and is not shown in the accompanying figures,
- a device 14 for expelling the containers 11 carried by the carousel 12 in the location A indicated by the identifier as the location of a nonconforming container 11a.

[0012] In general, in a substantially equivalent manner, an uprighter with selection according to the invention can comprise at least one sensor and/or more than one identifier and/or more than one expulsion device.

[0013] According to the invention, the uprighter with selection 10 conveniently comprises a device 15 for controlling the expulsion device 14, which preferably comprises a PLC, which is an acronym of the English expression "Programmable Logic Controller", which is functionally connected

- to the sensors 13, in order to receive from them information for detecting a nonconformity of a nonconforming container 11a,
- to such identifier, in order to receive from it information on the location A of the nonconforming container 11a detected by the sensors 13 in the carousel 12,
- to the expulsion device 14, in order to transmit thereto a command for expulsion from the carousel 12 of the nonconforming container 11a carried by the carousel at the identified location A.

[0014] Advantageously, the sensors 13 comprise

- a first video camera 16, which faces so as to view an upper portion of the containers 11 conveyed by the carousel 12,
- a second video camera 17, which faces so as to view a lower portion of the containers 11 conveyed by the carousel 12.

[0015] Conveniently, there are devices for lighting the containers 11 in transit in front of the video cameras 16 and 17, not shown in the accompanying figures.

[0016] In particular, therefore, such transducer of the angular position of the carousel 12 conveniently is functionally connected to the control device 15 in order to transmit thereto a signal for identification of the location A of a nonconforming container 11a, in the carousel 12, i.e., of one of the containers 11 that has nonconformities detected by at least one of the video cameras 16 and 17.

[0017] Moreover, the expulsion device 14 conveniently comprises a pneumatic piston 18, which is supported in the vicinity of the carousel 12 so as to face conveyance seats 19 for the containers 11.

[0018] The piston 18 is adapted to expel a container, carried by the carousel 12, from one of the conveyance seats 19 that corresponds to the location A identified by such identifier as the location of a nonconforming container 11a.

[0019] Advantageously, there is a movable surface 20 for unloading the nonconforming containers 11a expelled from the carousel 12 by way of the action of the expulsion device 14.

[0020] The movable unloading surface 20 is conveniently arranged below the carousel 12 and with respect to it in opposition to the expulsion device 14.

[0021] The operation of the uprighter with selection 10, according to the invention, is as follows.

[0022] The containers 11 are accommodated in the conveyance seats 19 of the carousel 12, which by rotating about its own axis B causes its advancement C.

[0023] During the advancement C, the containers 11 pass in the vicinity of a photocell 21 that is adapted to detect their presence or absence in the conveyance seats 19 in order to count them.

[0024] Subsequently, the containers 11 pass at the sensors 13, where the video cameras 16 and 17 check their conformity according to predefined parameters, reporting to the control device 15 any presence of nonconformities.

[0025] In particular, in case of reporting of nonconformities, detected by means of at least one of the video cameras 16 and 17, the control device 15 associates with such nonconformity information the information of the location A, which it receives from such identifier, i.e., of the location, in the carousel 12, of the container 11 that has such nonconformity.

[0026] On the basis of this information of a nonconforming container 11a that is present in the location A of the carousel 12, the control device 15 actuates the expulsion device 14, which expels the nonconforming container 11a from the carousel 12.

[0027] More particularly, the expulsion D of the nonconforming container 11a occurs by means of the action of a thrust E that it receives downward from above from the piston 18 when the location A, and therefore the nonconforming container 11a, is arranged below it.

[0028] Thus, the nonconforming container 11a is unloaded from the uprighter with selection 10 by means of the movable unloading surface 20, which opens below the region of action of the piston 18.

[0029] The containers 11b, among the containers 11, that are not expelled are received by a fork 22, which is arranged tangent to the carousel 12, in the immediate vicinity of the expulsion device 14, for transfer F to a working station that is located after the uprighter with selection 10.

[0030] In practice it has been found that the invention achieves the intended aim and objects, providing an uprighter with selection, particularly for containers made of plastics, such as bottles and the like, that allows to select and reject nonconforming containers.

[0031] In particular, furthermore, an uprighter with selection according to the invention allows to reject in an effectively selective manner only containers that have nonconformities, without rejecting the entire group to which a nonconforming container belongs.

[0032] Moreover, an uprighter with selection according to the invention is structurally simple and easy to use and therefore can be manufactured with very low costs with respect to currently known selection and rejection devices.

[0033] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0034] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

[0035] The disclosures in Italian Patent Application No. PD2009A000137 from which this application claims priority are incorporated herein by reference.

[0036] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. An uprighter with selection, particularly for containers (11) made of plastics, such as bottles and the like, comprising a carousel (12) for conveying containers (11), **characterized in that** it comprises

   - at least one sensor (13) for detecting nonconformities of containers (11) conveyed by said carousel (12),
   - at least one identifier of the location (A) of a nonconforming container (11a), in said carousel (12), reported by said sensor (13),
   - at least one device (14) for expelling containers

(11) carried by said carousel (12) in said location (A), indicated by said at least one identifier as the location of a nonconforming container (11a).

2. The uprighter with selection according to claim 1, **characterized in that** it comprises a device (15) for controlling said at least one expulsion device (14), which is functionally connected to

- said at least one sensor (13) in order to receive from it information for detecting a nonconformity of a nonconforming container (11a),
- at least one identifier in order to receive from it information on said location (A) of a nonconforming container (11a),
- said at least one expulsion device (14) in order to transmit thereto a command for expulsion from said carousel (12) of a nonconforming container (11a), carried by said carousel at said location (A) of a nonconforming container (11a).

3. The uprighter with selection according to one or more of the preceding claims, **characterized in that** said at least one sensor (13) comprises

- a first video camera (16), which faces so as to view an upper portion of containers (11) conveyed by said carousel (12),
- a second video camera (17), which faces so as to view a lower portion of containers (11) conveyed by said carousel (12).

4. The uprighter with selection according to one or more of the preceding claims, **characterized in that** said at least one identifier comprises a transducer of the angular position of said carousel (12), which is functionally connected to said controlling device (15) of said at least one expulsion device (14) in order to transmit thereto a signal that identifies said location (A), in said carousel (12), of a nonconforming container (11a) that has nonconformities detected by said at least one sensor (13).

5. The uprighter with selection according to one or more of the preceding claims, **characterized in that** said at least one expulsion device (14) comprises a pneumatic piston (18), which is supported in the vicinity of said carousel (12) so as to face conveyance seats (19) for said containers (11), said piston (18) being adapted to expel a container (11), which is conveyed by said carousel (12), from one of said conveyance seats (19) that corresponds to said location (A) of a nonconforming container (11a).

6. The uprighter with selection according to one or more of the preceding claims, **characterized in that** it comprises a movable surface (20) for unloading a container (11) expelled from said carousel (12) by way of the action of said at least one expulsion device (14), arranged below said carousel (12) and with respect to it in opposition to said at least one expulsion device (14).

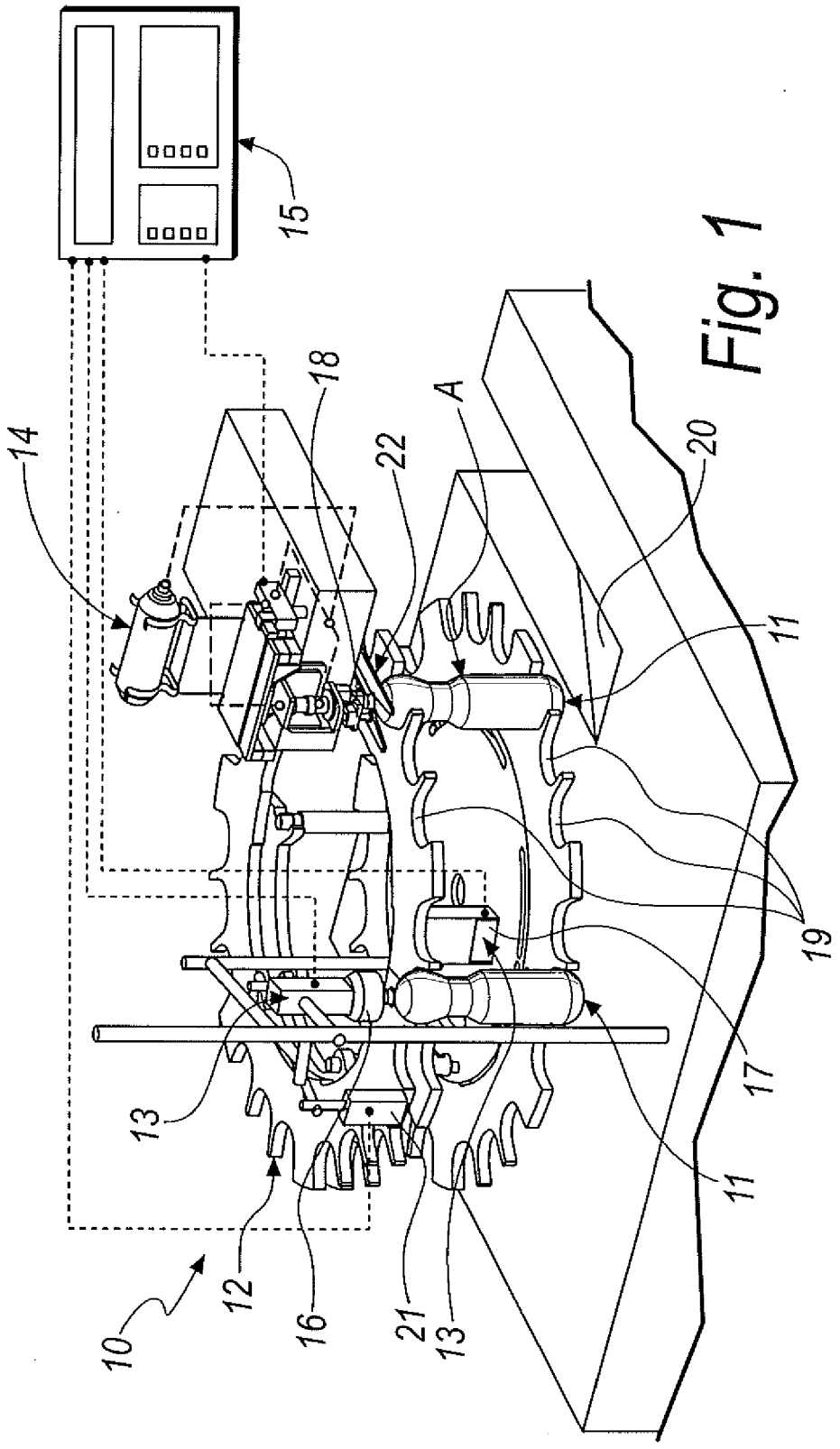

Fig. 1

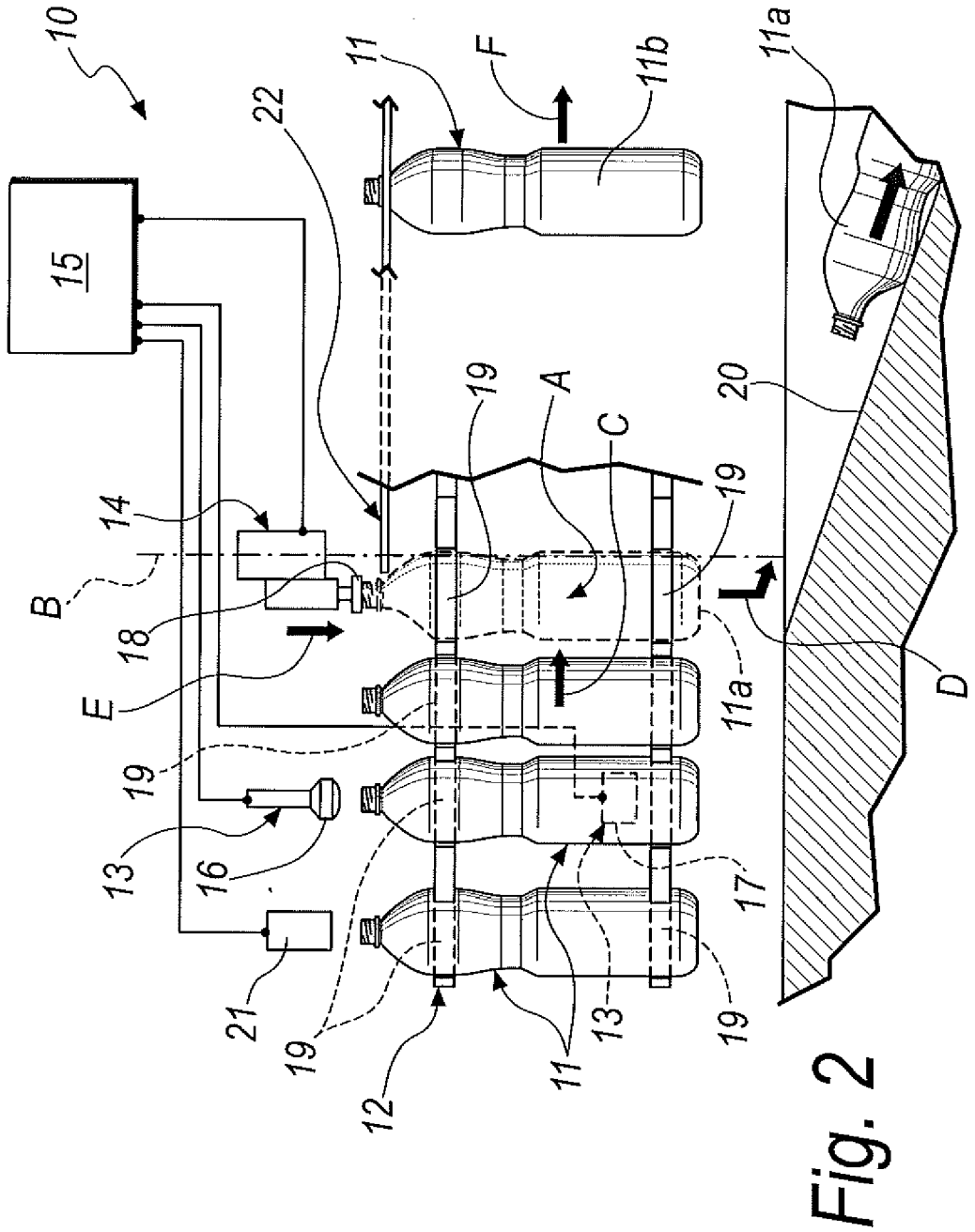
10
15
22
11
F
11b
11a
19
A
C
20
14
B
18
E
19
13
16
21
19
12
11
13
19
17
11a
D

Fig. 2

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT PD20090137 A **[0035]**