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(54) Title: AN APPARATUS AND METHOD FOR DISPENSING MOLLASSES INTO CONTAINERS

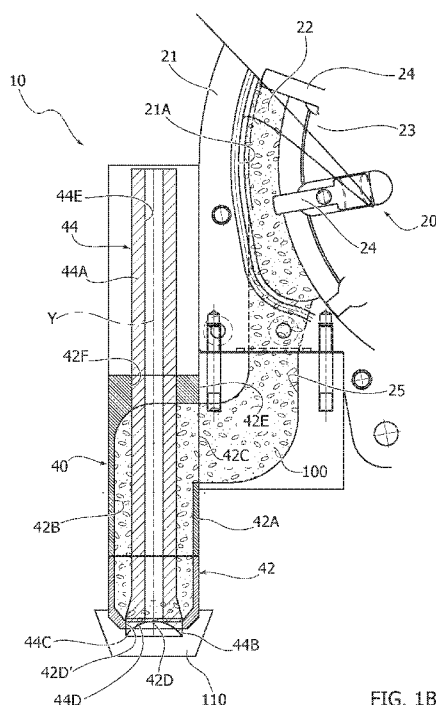


FIG. 1B

(57) Abstract: An apparatus (10) is described for dispensing molasses into containers (110), comprising: - an extruding device (20) for making a continuous rod of molasses (100); - a valve unit (40) comprising a nozzle (42) having an opening (42D) for delivering the molasses rod (100), and a closing member (44), which is movable between an open position, in which the molasses rod is allowed to pass through the opening (42D) of the nozzle (42), and a closing position, in which the closing member (44) closes the opening (42D) of the nozzle so as to separate a predetermined quantity of molasses (100) from the continuous rod of molasses (100).



**“An apparatus and method for dispensing molasses into containers”**

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**TEXT OF THE DESCRIPTION**

The present invention relates to an apparatus for dispensing molasses into  
5 containers.

The Italian patent application no. BO2007A000195 discloses a plant for  
packaging tobacco molasses comprising an extruding unit for obtaining a  
continuous rod of molasses, means for cutting the continuous rod of molasses into  
single doses, which are dispensed onto a continuous wrapping tape that is  
10 advanced horizontally, a winding unit for wrapping the single doses of molasses  
in the continuous wrapping tape forming a rod, and rod cutting means for  
separating the single doses of wrapped molasses.

Molasses is formed by a liquid/gelatinous component within which  
material fibers, such as tobacco, are dispersed. As described in document  
15 BO2007A000195, the plant described here envisages the dispensing of molasses  
onto a wrapping tape that travels horizontally since the composition of the  
molasses (liquid/gelatinous with dispersed fibers) would not allow its vertical  
dispensing.

This known solution is, therefore, not usable if it is required to package  
20 the molasses inside preformed containers instead of wrapping it inside a wrapper.

The object of the present invention is to overcome the aforesaid drawback.  
In particular, the solution described here has the object of producing an apparatus  
capable of dispensing molasses inside containers, in a precise and efficient manner,  
for the purpose of implementing a highly automated process for packaging  
25 molasses into containers.

The indicated object is achieved by means of an apparatus according to  
claim 1.

The present invention also relates to a method according to claim 10.

The claims form an integral part of the disclosure provided here.

30 Further characteristics and advantages of the present invention will  
become evident from the description that follows with reference to the attached  
drawings, provided purely by way of non-limiting example, wherein:

- Figures 1A, 1B schematically represent an embodiment of the apparatus  
described herein, in two different operating conditions, respectively;

35 - Figure 2 shows an example of a plant for packaging molasses into  
containers comprising the apparatus described herein.

In the following description various specific details are illustrated aimed at a thorough understanding of the embodiments. The embodiments may be implemented without one or more of the specific details, or with other methods, components, materials, etc. In other cases, known structures, materials or operations are not shown or described in detail to avoid obscuring various aspects of the embodiments.

The references used here are only for convenience and do not therefore define the field of protection or the scope of the embodiments.

With reference to Figures 1A and 1B, the apparatus described here - indicated as a whole by the reference number 10 - comprises an extruding device 20 for making a continuous rod of molasses 100 (illustrated only in Figure 1B).

The extruding device 20, which is shown only partially in Figures 1A and 1B, may be of a known type and, in particular, may be produced according to the disclosure of the patent application BO2007A000195 cited above.

In this regard, according to the embodiment illustrated, the extruding device 20 comprises a casing 21 provided with an inner cavity 22 within which the molasses is received. A rotor 23 is rotatably mounted inside the cavity 22 of the casing 21, from the peripheral region of which a series of radially movable blades 24 protrude radially. During rotation of the rotor 23, the blades 24 remain in a completely extracted position immediately adjacent to the inner wall 21A that delimits the inner cavity 22, to perform a compacting action of the molasses along the circumferential direction of the rotor 23.

The cavity 22 communicates at the bottom with a conduit 25 for feeding the molasses. The blades 24 move into a retracted position during the approach to the conduit 25, so as to allow the joining of pieces of compacted molasses, and the formation of the beginning of a rod of molasses inside the chamber 22, which then emerges and continues in the conduit 25.

The apparatus 10 also comprises a valve unit 40 comprising a nozzle 42 for dispensing the rod of molasses, and a movable closing member 44 for controlling the amount of molasses dispensed by the nozzle 42.

In one or more preferred embodiments, such as the one illustrated, the nozzle 42 comprises a tubular body 42A provided with an inner passage 42B for the molasses, which extends between an inlet 42C, obtained on the outer side surface 42E of the tubular body, and an opening 42D for dispensing the molasses, formed at the lower end of the tubular body.

In one or more preferred embodiments, such as the one illustrated, the closing member 44 comprises a stem 44A, which fits inside the tubular body 42A

through an upper opening 42F of the tubular body, and is provided with a lower end 44B for closing the opening 42D of the nozzle 42. The stem 44A and its lower end 44B have a diameter significantly smaller than the diameter of the inner passage 42B of the tubular body 42A, so that a passage section for the molasses is formed between the inner wall of the inner passage 42B and the outer side surface of the stem 44A, that is large enough to reduce the resistance to its sliding.

The closing member 44 is movable along its longitudinal axis Y between a raised open position (Figure 1A), in which the end 44B is inside the passage 42B, and a lowered closing position (Figure 1B), in which the end 44B fits into the opening 42D preventing the passage of the molasses 100 therethrough. The movement of the closing member 44 is actuated by an actuator 45, which may, for example, be a linear solenoid actuator or a rotary electric motor coupled to transmission means, for example, a screw-nut transmission unit. The apparatus may comprise a control unit 48 to control the actuator 45 according to the pre-established opening/closing times of the closing member 44, as will be seen below.

In one or more preferred embodiments, such as the one illustrated, the opening 42D is delimited by a cylindrical inner edge 42D' and the end 44B of the closing member 44 has a complementary cylindrical outer surface 44B'.

Furthermore, in one or more preferred embodiments, such as the one illustrated, the end 44B of the closing member 44 comprises a cutter 44C arranged to cooperate with the inner edge 42D' of the opening 42D so as to cut the molasses that are trapped between the same edge 42D' and the end 44B, as a result of the movement of the closing member 44 from the raised open position to the lowered closing position.

In one or more preferred embodiments, such as the one illustrated, a hollow surface 44D is formed on the end 44B of the closing member 44, which faces downwards, and intersects along its outer perimeter the cylindrical outer surface 44C, determining a sharp edge defining the cutter 44C.

In one or more preferred embodiments, such as the one illustrated, the closing member 44 also comprises an inner suction duct 44E, which opens onto the hollow surface 44D, and by means of which the closing member 44 may perform a suction action for retaining any residual molasses generated during cutting. The inner conduit 44E is connected to air-suction means (not illustrated).

With reference now to the operation of the apparatus described above, the extruding device 20 generates a continuous rod of molasses 100, which is fed to the valve unit 40 by means of the supply conduit 25. The rod of molasses 100

enters from the inlet 42C into the inner passage 42B of the nozzle body 42 and then reaches the opening 42D through which it is dispensed.

The closing member 44 performs the function of controlling the quantity of molasses dispensed, by closing the opening 42D of the nozzle 42, so as to  
5 separate a predetermined quantity of molasses already dispensed through the opening 42D, from the continuous rod 100, which remains, instead, inside the nozzle 42.

In particular, the closing member 44 is operated according to predetermined opening times and closing times, so that predetermined quantities  
10 of molasses are dispensed in succession, through the opening 42D. The variation of the aforesaid opening and closing times allows the quantity of molasses dispensed by the apparatus to be varied. In one or more preferred embodiments, the control unit 48 may, for example, comprise a memory module containing a look-up table in which the relative opening/closing times are saved for different  
15 predetermined quantities of molasses.

The cutter 44D obtained on the closing member 44 facilitates the separation of the aforesaid predetermined quantity of molasses from the continuous rod 100.

The predetermined quantity of molasses, which is dispensed by the  
20 dispensing apparatus 10, may be released into a container for its packaging.

In view of the above, the dispensing apparatus described herein is therefore capable of dispensing single doses of molasses in a precise and repeatable manner. Furthermore, the proposed dosing apparatus 10 is capable of dispensing single doses of molasses in a clean manner.

25 With reference now to Figure 2, this illustrates an example of a plant for packaging molasses inside containers that comprises a dispensing apparatus as described above.

The plant in Figure 2 - indicated as a whole with the reference number 50 - comprises a conveyor 51 for transporting containers 110 in succession along a  
30 series of stations 52, 54, 55, 56 (56'), 58. The conveyor 51 may, for example, comprise a linear conveyor comprising a rail 51A, preferably extending along a closed annular path, and carriages 51B movable on the rail, on which the containers 110 are arranged; the carriages 51B may be movable independently of each other thanks to a linear electric motor system comprising a fixed part, for example  
35 comprising permanent magnets distributed along the entire rail 51A, and a movable part comprising, for example, one or several electric windings, arranged on each carriage 51B.

The plant 50 may comprise an inlet station 52 where the empty containers 110 are transferred to the conveyor 51, and an outlet station 58, for transferring the containers 110, filled with molasses and preferably closed, to a downstream line of the plant (not illustrated).

5       The plant 50 comprises a molasses dispensing station 54, in which the dispensing apparatus 10 described above is arranged, which dispenses predetermined doses of molasses inside the empty containers 110. The conveyor 51 may be arranged to feed the succession of containers 110 to a dosing position P1, below the nozzle 42. In one or more preferred embodiments, the nozzle 42 may  
10 be vertically movable to fit inside the container 110 in the dispensing position, before dispensing the dose of molasses.

      The plant 50 may, furthermore, comprise a weighing station 56 downstream of the dispensing station 54, and possibly also a weighing station 56' upstream of the dispensing station, to control the amount of molasses actually  
15 dispensed into the containers 110 (those skilled in the art will understand that the weighing station 56' may be used to weigh the empty containers 110 to take into account any differences in weight between one container 110 and another).

      Finally, the plant 50 may comprise a station 55 for applying lids (not illustrated) on the individual containers 110 filled with molasses, for closing them,  
20 to complete the final package.

      Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary, even significantly, with respect to those illustrated here, purely by way of non-limiting example, without departing from the scope of the invention as defined by the attached claims.

25

## CLAIMS

1. An apparatus (10) for dispensing molasses into containers (110), comprising:

- an extruding device (20) for making a continuous rod of molasses (100);
- 5       - a valve unit (40) comprising a nozzle (42) having an opening (42D) for delivering the molasses rod (100), and a closing member (44), which is movable between an open position, in which the molasses rod is allowed to pass through the opening (42D) of the nozzle (42), and a closing position, in which the closing member (44) closes the opening (42D) of the nozzle so as to separate a
- 10       predetermined quantity of molasses (100) from the continuous rod of molasses (100).

2. An apparatus according to claim 1, wherein the nozzle (42) is vertically movable for inserting itself into a container (110) that is at a dispensing position (P1) below the nozzle, forward-movement means (51) being provided for feeding

15       a succession of containers (110) to the dispensing position (P1).

3. An apparatus according to claim 1 or 2, wherein the closing member (44) comprises a cutter (44C) configured to cooperate with an inner edge (42D') of the opening (42D) so as to cut the molasses trapped between the closing member (44) and the inner edge (42D') of the opening (42D), as a result of the closing

20       member (44) moving from the open position to the closed position.

4. An apparatus according to claim 3, wherein the nozzle (42) comprises a tubular body (42A) having the opening (42D) at one end, and wherein the closing member (44) is movable in translation along the axis of the tubular body (42A).

5. An apparatus according to claims 3 or 4, wherein the cutter (44C) has a

25       closed profile.

6. An apparatus according to any one of the preceding claims, wherein the closing member (44) comprises a closing outer surface (44') shaped so that, when the closing member (44) is in the closing position, said outer closing surface (44B') is arranged into contact with the inner edge (42D') of the opening (42D).

7. An apparatus according to claim 6 depending on any one of claims 3 to 5, wherein on the end (44B) of the closing member (44) a hollow surface (44D) is made, the intersection between the closing outer surface (44B') and the hollow surface (44D) defining said cutter (44C).

30

8. An apparatus according to any one of the preceding claims, wherein the closing member (44) comprises an inner suctioning conduit (44E) reaching the outside of the closing member (44), preferably next to the cutter (44C).

35

9. An apparatus according to any one of the preceding claims, comprising

an actuator (45) for driving the movement of the closing member (44), and a control unit (48) for controlling the actuator based on predefined opening and closing times.

10        **10.** A method for dispensing molasses into containers (110), comprising the steps of:

- making a continuous rod of molasses (100);
- placing a nozzle (42) above or inside a container opened at the top;
- dispensing the continuous rod of molasses through an opening of the nozzle (42);

15        - driving a closing member (44) to close the opening (42D) of the nozzle (42) so as to separate a predetermined quantity of molasses from the molasses rod, which is released into the container (110).

20        **11.** A method according to claim 10, comprising, before dispensing the molasses, the step of moving the nozzle (42) downwards to insert it into the container (110).

25        **12.** A method according to claim 10 or 11, further comprising the step of cutting, by means of a cutter (44C) of the closing member, the molasses that are trapped between the closing member (44) and an inner edge (42D') of the opening (42), as a result of the closing member (44) moving from an open position to a closing position.

30        **13.** A method according to claim 12, comprising the step of suctioning molasses waste generated by cutting by means of an inner suctioning conduit (44E) of the closing member (44), which reaches the outside of the closing member (44) next to the cutter (44C).

35        **14.** A plant for packaging molasses inside containers (110), comprising:

- a dispensing apparatus according to any one of claims 1 to 9; and
- a conveyor (51) for successively feeding the containers (110) to a dispensing position (P1) below the nozzle (42) of said apparatus.

FIG. 1A

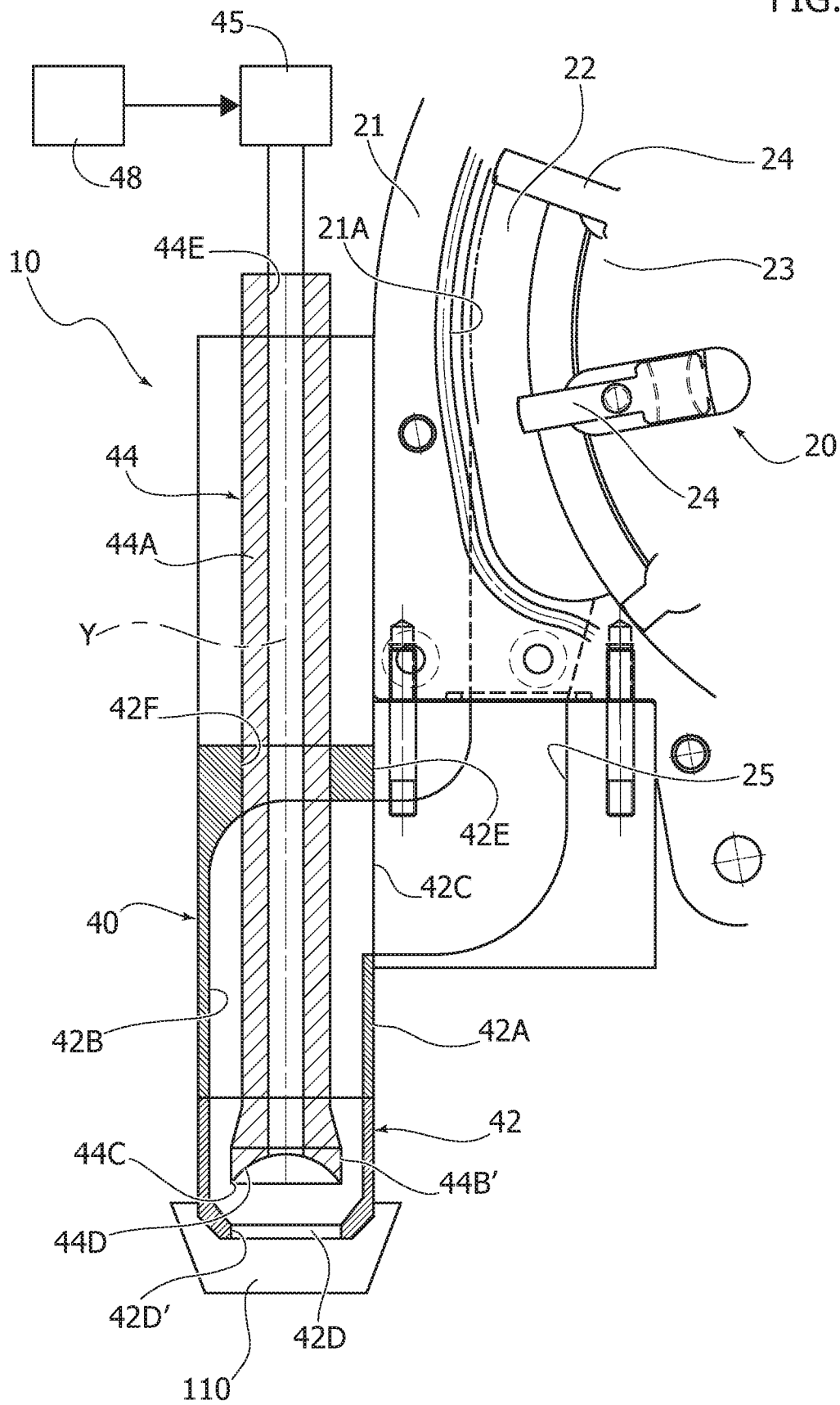


FIG. 1B

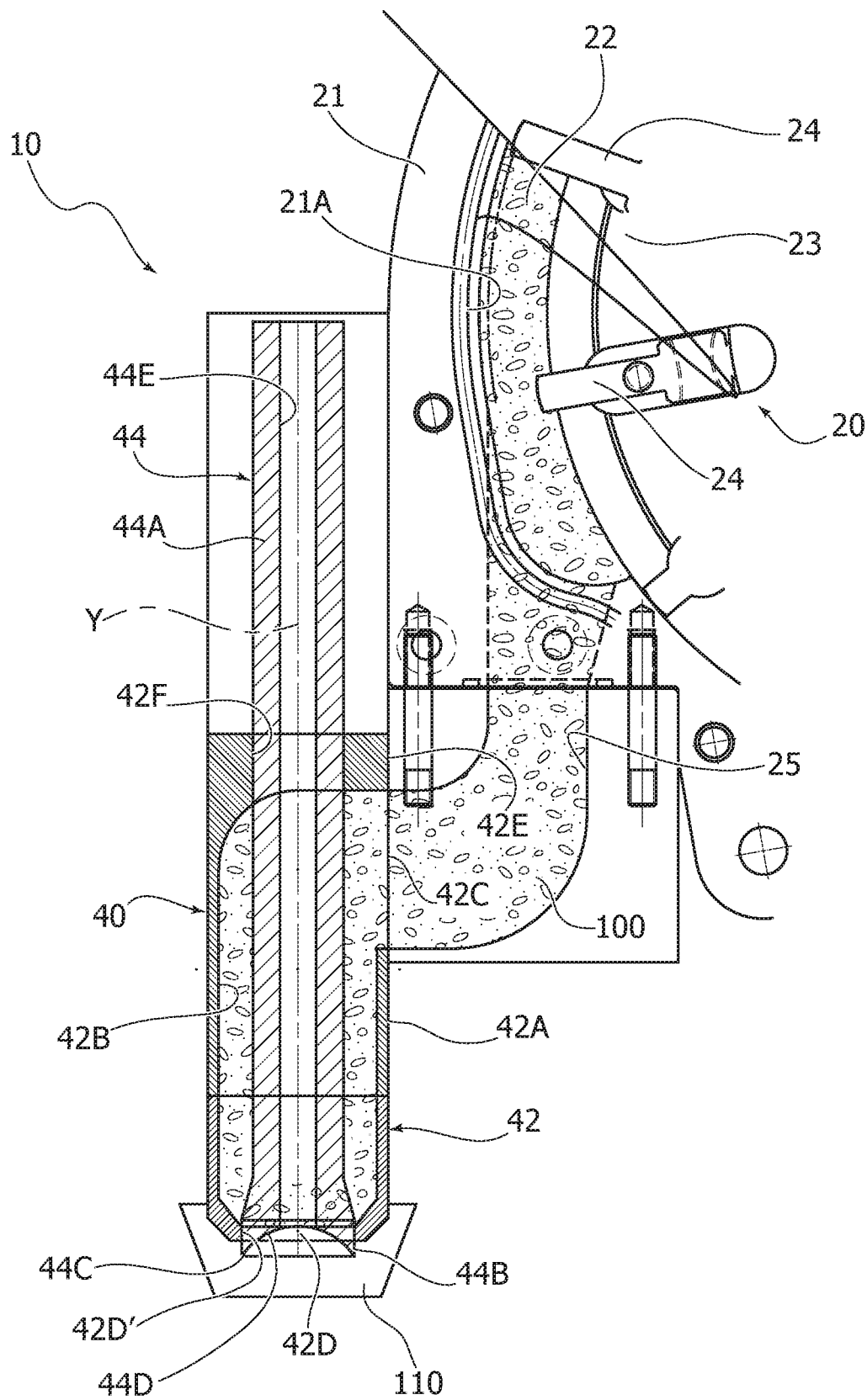
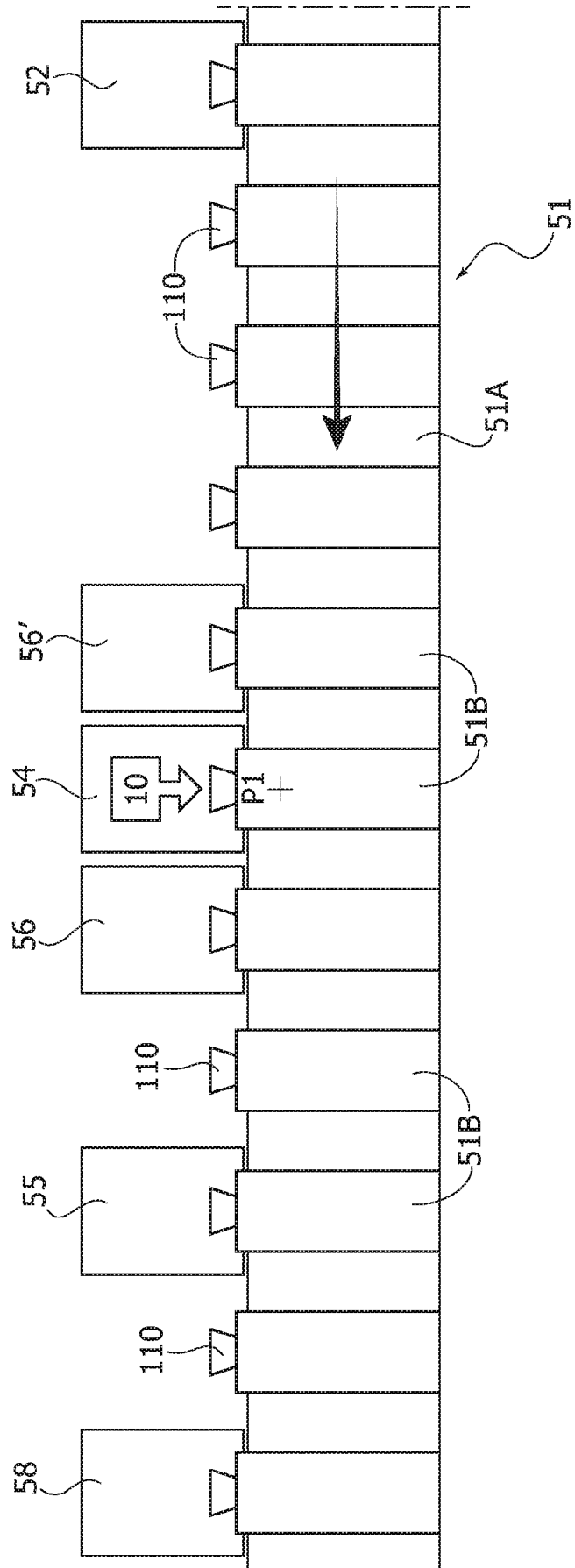


FIG. 2



## INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2023/051608

## A. CLASSIFICATION OF SUBJECT MATTER

INV. B65B19/00 B65B39/00 B65B39/12 A24B3/14  
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

**B65B A24F A24B**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**EPO-Internal, WPI Data**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                | Relevant to claim No. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Y         | US 1 871 655 A (BOND CHARLES L)<br>16 August 1932 (1932-08-16)<br>page 1, line 1 - page 3, line 60<br>-----                       | 1-8, 10               |
| Y         | EP 0 299 803 A2 (PHILIP MORRIS [US])<br>18 January 1989 (1989-01-18)<br>column 2, line 42 - column 4, line 26<br>-----            | 1-14                  |
| Y         | GB 1 484 763 A (SCHOLLE CORP)<br>8 September 1977 (1977-09-08)<br>page 2, line 3 - page 3, line 54<br>-----                       | 1-14                  |
| Y         | KR 2021 0111433 A (LEEPACK CO LTD [KR])<br>13 September 2021 (2021-09-13)<br>paragraph [0012] - paragraph [0028]<br>-----<br>-/-- | 1-14                  |



Further documents are listed in the continuation of Box C.



See patent family annex.

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## INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2023/051608

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                                                                                     |                       |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Category*                                            | Citation of document, with indication, where appropriate, of the relevant passages                                                                  | Relevant to claim No. |
| Y                                                    | WO 2006/091159 A1 (NORDEN PAC DEV AB [SE];<br>SOEDERSTROEM HANS [SE])<br>31 August 2006 (2006-08-31)<br>page 4, line 11 - page 11, line 25<br>----- | 1-14                  |
| Y                                                    | US 5 822 958 A (DAVIS STEVEN D [US])<br>20 October 1998 (1998-10-20)<br>column 2, line 45 - column 5, line 7<br>-----                               | 1-14                  |
| Y                                                    | CA 2 048 950 A1 (COLGATE PALMOLIVE CO<br>[US]) 14 February 1992 (1992-02-14)<br>page 6, line 5 - line 6<br>-----                                    | 2, 8, 11,<br>13       |
| Y                                                    | CA 1 222 489 A (COLGATE PALMOLIVE CO)<br>2 June 1987 (1987-06-02)<br>page 4, line 1 - page 7, line 17<br>-----                                      | 8, 13                 |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2023/051608

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| US 1871655                                | A  | 16-08-1932          | NONE                       |                     |
| EP 0299803                                | A2 | 18-01-1989          | AU 614975 B2               | 19-09-1991          |
|                                           |    |                     | EP 0299803 A2              | 18-01-1989          |
|                                           |    |                     | US 4874000 A               | 17-10-1989          |
| GB 1484763                                | A  | 08-09-1977          | NONE                       |                     |
| KR 20210111433                            | A  | 13-09-2021          | NONE                       |                     |
| WO 2006091159                             | A1 | 31-08-2006          | BR PI0607471 A2            | 08-09-2009          |
|                                           |    |                     | CN 101107167 A             | 16-01-2008          |
|                                           |    |                     | EP 1851112 A1              | 07-11-2007          |
|                                           |    |                     | JP 4955578 B2              | 20-06-2012          |
|                                           |    |                     | JP 2008531404 A            | 14-08-2008          |
|                                           |    |                     | PL 1851112 T3              | 31-12-2014          |
|                                           |    |                     | WO 2006091159 A1           | 31-08-2006          |
| US 5822958                                | A  | 20-10-1998          | NONE                       |                     |
| CA 2048950                                | A1 | 14-02-1992          | AU 648328 B2               | 21-04-1994          |
|                                           |    |                     | CA 2048950 A1              | 14-02-1992          |
|                                           |    |                     | CN 1058936 A               | 26-02-1992          |
|                                           |    |                     | DE 4126556 A1              | 20-02-1992          |
|                                           |    |                     | EG 19214 A                 | 30-11-1994          |
|                                           |    |                     | ES 2051159 A1              | 01-06-1994          |
|                                           |    |                     | FR 2665682 A1              | 14-02-1992          |
|                                           |    |                     | GB 2247672 A               | 11-03-1992          |
|                                           |    |                     | GR 910100349 A             | 31-08-1992          |
|                                           |    |                     | HK 1000141 A1              | 24-12-1997          |
|                                           |    |                     | IT 1249438 B               | 23-02-1995          |
|                                           |    |                     | JP H04253602 A             | 09-09-1992          |
|                                           |    |                     | KR 920004043 A             | 27-03-1992          |
|                                           |    |                     | MY 107956 A                | 15-07-1996          |
|                                           |    |                     | NZ 239049 A                | 26-05-1994          |
|                                           |    |                     | PT 98650 A                 | 30-09-1993          |
|                                           |    |                     | RO 107913 B1               | 31-01-1994          |
|                                           |    |                     | RU 2043268 C1              | 10-09-1995          |
|                                           |    |                     | TR 27996 A                 | 13-11-1995          |
|                                           |    |                     | ZA 915594 B                | 31-03-1993          |
| CA 1222489                                | A  | 02-06-1987          | AU 571454 B2               | 21-04-1988          |
|                                           |    |                     | CA 1222489 A               | 02-06-1987          |