



(22) Date de dépôt/Filing Date: 1997/02/14

(41) Mise à la disp. pub./Open to Public Insp.: 1997/08/15

(45) Date de délivrance/Issue Date: 2005/10/04

(30) Priorité/Priority: 1996/02/15 (9600367) ES

(51) Cl.Int.<sup>7</sup>/Int.Cl.<sup>7</sup> B65G 51/02, B67C 3/24

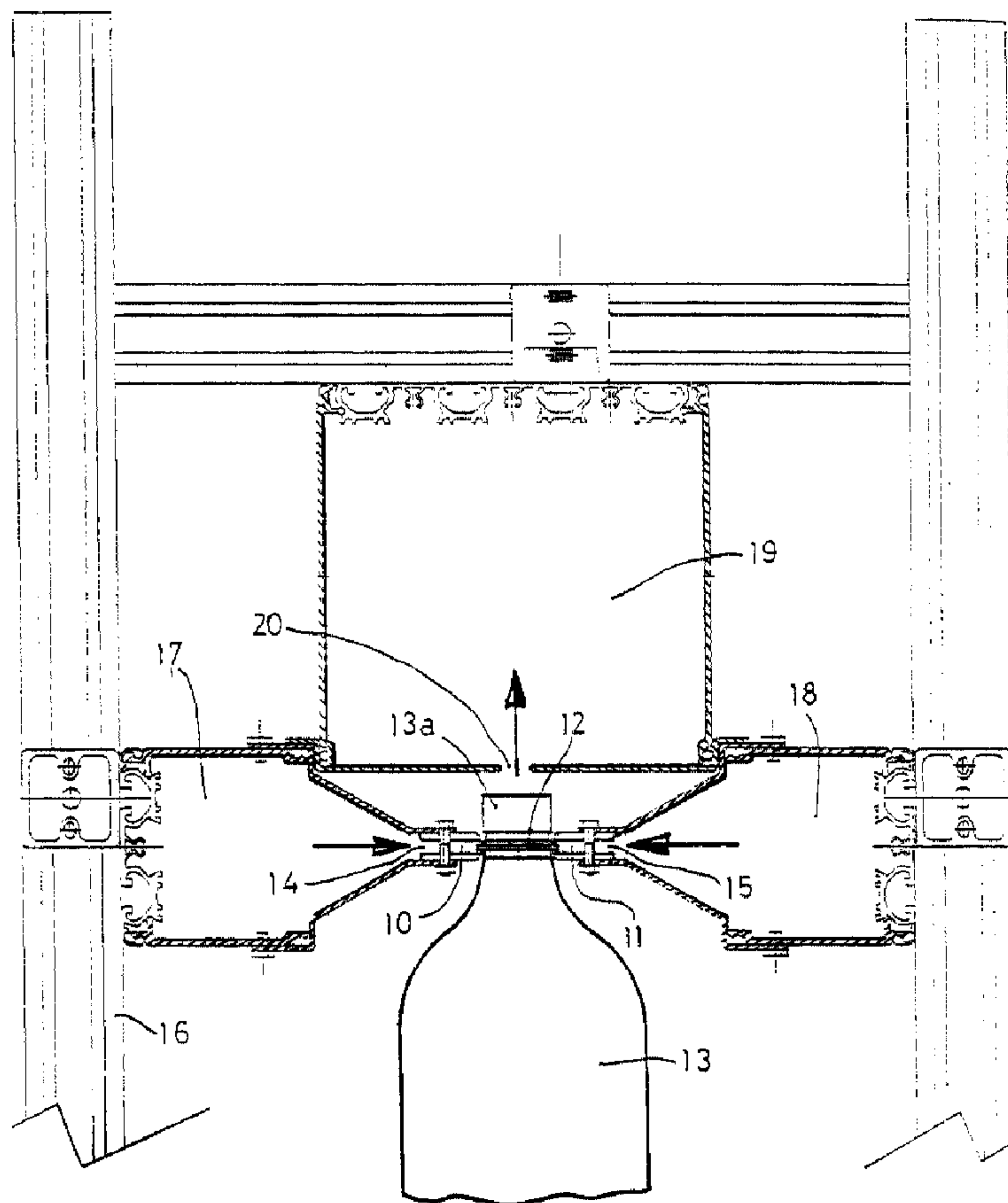
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(54) Titre : APPAREIL DE MANUTENTION DE BOUTEILLES PAR SUSPENSION

(54) Title: A DEVICE FOR CONVEYING EMPTY BOTTLES IN A HANGING ARRANGEMENT



(57) Abrégé/Abstract:

Applicable to the conveyance of bottles (13) made of plastics material, the bottles (13) comprising a flange (12) in the region of their neck (13a), the flange being partially introduced and guided in lateral channels (10, 11) whose open sides are facing each other,



(57) **Abrégé(suite)/Abstract(continued):**

the flange (12) resting on the lower edge of the respective channel and being in a position to slide along the channels, outlets (14, 15) for insufflating pressurized air from lateral ducts (17, 18) having been provided inside the channels (10, 11). Above the path traced by the necks (13a) of the bottles (13) extends a duct (19) which opens onto said path at a slot (20) and is connected to a suction device that generates a negative pressure.

## A B S T R A C T

**A device for conveying empty bottles in a hanging arrangement.**

Applicable to the conveyance of bottles (13) made of plastics material, the bottles (13) comprising a flange (12) in the region of their neck (13a), the flange being partially introduced and guided in lateral channels (10, 11) whose open sides are facing each other, the flange (12) resting on the lower edge of the respective channel and being in a position to slide along the channels, outlets (14, 15) for insufflating pressurized air from lateral ducts (17, 18) having been provided inside the channels (10, 11). Above the path traced by the necks (13a) of the bottles (13) extends a duct (19) which opens onto said path at a slot (20) and is connected to a suction device that generates a negative pressure.

A DEVICE FOR CONVEYING EMPTY BOTTLES  
IN A HANGING ARRANGEMENT

Field of the Invention

The present invention concerns a device for conveying empty bottles  
5 in a hanging arrangement, the device being in particular appropriate for  
conveying lightweight bottles made of plastics material and of the type  
comprising a collar-flange in the region of their neck, the flange being  
provided to hangingly rest on guide tracks, and of the type comprising  
10 pressurized air supply means arranged at both sides of the bottle travelling  
path and conveniently oriented to apply a thrust to said bottles thereby  
conveying them in a push-on direction along said tracks.

Background of the Invention

Patent EP-A-344417 describes an apparatus for the conveyance of  
plastic bottles of the aforementioned characteristics, the apparatus being  
15 characterized in that the pressurized air insufflation nozzles, inclined in the  
bottle push-on direction, are arranged in an area basically affecting the upper  
portion directly next to the bottle neck.

On the other hand, patent application EP-A-423261 describes a  
conveyor device of the mentioned type where pressurized air insufflation  
20 nozzles have been provided which act by supplying air jets oriented above and  
below the track supporting the flange or collar of said neck.

In the above-mentioned publications of prior art, as well as in the  
known devices of the prior art, the flange or collar of the neck of the bottle  
or container rests on tracks arranged at both sides of the conveyance path, and  
25 the air insufflating means act obliquely from both sides on the bottle body or  
even above said flange (EP-A-423261). Such an arrangement entails that the  
bottle can tilt out of its vertical center line and in particular swing with respect  
to the hanging area thereby risking to cause jams and disturb the smooth  
pushing-on and also being likely to cause damages to the outer surface or wall

30 of the bottle (caused by blows against the guide tracks) thereby ruining the latter's integrity.

### Summary of the Invention

The device as per the invention seeks to obviate the above-mentioned drawbacks, and to such an effect it has been foreseen that the aforementioned  
35 collar-flange of the bottle or container to be conveyed rests at both sides on a lower track to which a corresponding parallel profile is superimposed which limits the tilting motion of the flange and thereby the possible swinging of the bottle with respect to the hanging area, the track and profile together delimiting respective lateral channels whose open sides are facing each other  
40 and whose cross-section has for example the shape of a lying "U", the open sides receiving and longitudinally guiding the collar-flanges of the bottles during their conveyance.

Also, characteristic of the device as per the invention is the fact that inside the above-mentioned channels which are facing each other and are  
45 provided to support and longitudinally guide the bottles in hanging arrangement outlets have been provided through which it has been foreseen to insufflate pressurized air, the outlets adopting an adequate inclination such that the pressurized fluid circulating through them applies a push-on thrust to the bottles in such a way that the flanges of their necks slide along the  
50 aforementioned channels thereby being guided by them.

Another salient aspect of the invention consists in the fact that above the bottle neck guide path, a duct has been provided which opens onto the path, for example, at a slot centred on said path, the duct being connected to a suction device generating a negative pressure (of adjustable magnitude)  
55 which tends to lift the bottles. Such a combination of elements and their respective arrangement result in the bottles sliding with a minimum friction along the lateral channels provided to guide their collar-flange, this latter being driven on an air cushion created by the impulsion of said pressurized

fluid through the inside of said channels, and by the additional effect of an  
60 upward lift of the bottles caused by the suction force exerted from the upper  
duct in such a way that the bottle practically floats as it slides on said lateral  
channels. The upper suction can also extract dust and other particles from the  
inside of the bottles thereby contributing to keep them clean.

The above and other objects, advantages and features of the present  
65 invention will become more apparent from the following description of certain  
preferred embodiments thereof.

#### Brief Description of the Drawing

The invention will now be described in detail with reference to the  
accompanying drawings wherein:

70 The Fig. 1 is a vertical cross-section of the bottle conveyance path as  
has been explained above showing the basic elements of the invention and  
their operational interaction (fluid circulation arrows).

#### Detailed Description of the Preferred Embodiment

According to the invention the known guide tracks of the prior art have  
75 been formed here by two lateral channels (10), (11) whose cross-section is  
shaped like a lying "U" and whose open sides are directly facing each other  
and receive distal portions of the collar-flange (12) of the bottles (13) to be  
conveyed, the flanges (12) being thus guided inside said channels (10, 11),  
resting on the lower edge of the respective channel and being in a position to  
80 longitudinally slide by effect of the pressurized air insufflation from the inside  
of the channels (10, 11) which have been provided with pressurized air supply  
outlets (14), (15). To such an effect it can be seen that on each of the side  
members of the frame (16) supporting the conveyor a corresponding duct (17),  
(18) has been provided through which pressurized air is impelled and passes  
85 through the aforementioned outlets (14, 15) formed by inclined nozzles  
oriented to favour the longitudinal travelling of the bottles (13) in a given  
push-on direction and in such a way that their flanges (12) slide along said

lateral channels (10, 11).

As has been explained, above the guided path traced by the bottle necks  
90 (13a) another duct (19) has been arranged which is open at a longitudinal slot  
(20) centred on the path, the duct (19) being connected to a suction device  
(not shown and having a structure known *per se*) generating a negative  
pressure.

It is understood that the device as per the invention will include some  
95 means known *per se* and provided to adjust to convenient values both the  
pressure of the air blown through the outlets (14, 15) and the strength of the  
negative pressure generated in duct (19), in order to adapt said values to the  
characteristics of the bottles to be handled.

The device of the invention can also be applied with the addition of a  
100 pressurized air insufflation onto the sides of the bottle (13) from both sides of  
the conveyor line, in order to push on the bottle in a hanging arrangement as  
per a conventional technique if this were deemed necessary.

## CLAIMS:

1. A device for conveying, in a hanging arrangement, empty lightweight bottles made of plastics material of the type including a body having a collar/flange in a region of their neck, said device comprising:

guide tracks for encompassing the flange of the bottles, being formed by two lateral channels having open sides facing each other and into which the flanges of the bottles are partially introduced and resting on a lower edge of the respective channel and slidable along it, and

means for the supply of pressurized air at both sides of the bottle body, said means being oriented to apply a thrust to the bottle body to convey the bottle body in a push-on direction along said tracks, characterized in that said pressurized air passes through the guide tracks.

2. A device as per claim 1, characterized in that pressurized air insufflation outlets are provided inside said lateral channels for insufflating pressurized air from lateral ducts.

3. A device as per claim 1, characterized in that a duct is located above a path followed by the bottle necks, said duct opens into said path and is connected to a suction device generating a negative pressure on the bottle necks.

4. A device as per claim 2, characterized in that said pressurized air insufflating outlets comprise inclined nozzles oriented to favor longitudinal traveling of the bottle in a given direction along said lateral channels.

**FIG. 1**

