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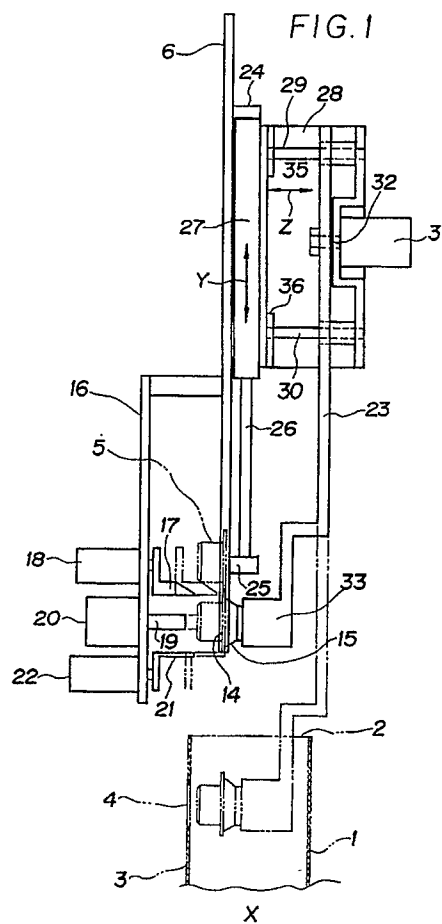
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Apparatus for inserting a pouring spout to a container.

An apparatus for inserting a pouring spout (5) to a container comprising an aligning feed chute (6) for feeding pouring spout (5), a holding portion (15) for holding the pouring spout (5) and a drive device coupled to a support arm (23) of the holding portion (15) for moving the holding portion (15), the aligning feed chute (6) being arranged upwardly of an upper end opening (2) of the container body (1) of the container having a pouring spout mounting hole (4) in a side surface (3) thereof, the holding portion (15) being disposed directly above the opening (2) of the container body (1), characterized in that the drive device reciprocates the holding portion (15) in vertical directions (Y) between a position opposed to an opening (14) for removing the pouring spout (5) of the aligning feed chute (6) and a position opposed to the pouring spout mounting hole (4) of the container, and further reciprocates the holding portion (15) in horizontal directions (Z) between a position opposed to the pouring spout mounting hole (4) of the container body and a position for inserting the pouring spout (5) into the pouring spout mounting hole (4). The apparatus for inserting the pouring spout (5) to a container of this invention employs a configuration in which the holding portion (15) of the apparatus can complete all steps from reception of the pouring spout (5) to insertion of the same by only four operations comprising vertical movements and horizontal movements.



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APPARATUS FOR INSERTING A POURING SPOUT TO A CONTAINER

BACKGROUND OF THE INVENTION

The present invention relates to an apparatus for inserting a pouring spout into a pouring spout mounting hole of a gable top type paper container filled with liquids such as juice, milk or the like from inside of the container.

As apparatus for mounting a pouring spout on a paper container of this kind, one shown in Japanese Patent Publication No. 64-2505 has been known. In this apparatus, a sucker for sucking the pouring spout and the paper container are relatively operated as shown in FIG. 6.

That is, six operations are carried out, i.e., movement from the original position A of the sucker to the sucking position B of the pouring spout, returning to the position C which is the original position A after suction, movement to the position D within the paper container, movement to the pouring spout inserting position E for insertion, returning to the position D, and returning to the original position A.

The gable type or the like paper container filled with liquids such as juice, milk or the like, that is, a carton is subjected, during intermittent movement on an assembling device, to necessary assembling processing at respective stations. However, stop time at individual stations is materially restricted due to higher speed of production. The pouring spout has to be inserted into a pouring spout mounting hole in the side surface of the paper container within a restricted short period of time. If six operations are required for insertion as in the aforementioned conventional apparatus, the individual operating time is extremely short. Thus, in this case, since each of the operations is carried out at high speed, there involves a problem in that even and accurate insertion of the pouring spout cannot be assured.

SUMMARY OF THE INVENTION

The object of the present invention is to provide an apparatus in which only four operations are required for insertion of the pouring spout within a limited time and even and accurate insertion of the pouring spout can be carried out.

For solving the aforementioned problem, the present invention employs a configuration in which an aligning feed chute of a pouring spout is arranged upwardly of an upper end opening of a container body having a pouring spout mounting

hole in the side surface thereof, a holding portion for holding pouring spout one by one is disposed directly above the opening of said container body, and a drive device for reciprocating the holding portion in vertical directions between a position opposed to an opening for removing the pouring spout of said aligning feed chute and a position opposed to the pouring spout mounting hole of the container body and further reciprocating the holding portion in horizontal directions between a position opposed to the pouring spout mounting hole of the container body and a position for inserting the pouring spout into the pouring spout mounting hole is coupled to a support arm of said holding portion. The side surface having the pouring spout mounting hole of the container body is formed to a top inclined surface after assembling the container body into a gable top type container as shown in FIG. 7.

The present invention has been configured as described above. Therefore, the holding portion of the inserting apparatus can complete the operation for inserting the pouring spout into the pouring spout mounting hole of the container body merely by four operations, a first operation wherein the holding portion receives the pouring spout at the position opposed to the opening for removing the pouring spout of the aligning feed chute and thereafter moves down to the position opposed to the pouring spout mounting hole of the container body, a second operation wherein the holding portion advances to the pouring spout mounting hole to insert the pouring spout, a third operation wherein the holding portion is moved backward from said position and returns to the position opposed to the pouring spout mounting hole, and a fourth operation wherein the holding portion moves upward from said position to the position opposed to the opening for removing the pouring spout of the aligning feed chute.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic side view of one example of an embodiment;

FIG. 2 is an enlarged view taken on line II-II of FIG. 3 of an open window as an opening for removing the pouring spout of an aligning feed chute;

FIG. 3 is an enlarged sectional view taken on line III-III of FIG. 2;

FIG. 4 is an enlarged bottom view of one shown in FIG. 2;

FIG. 5 is an explanatory view of a motion locus of a holding portion according to the present invention;

FIG. 6 is an explanatory view of a motion locus of a sucker of a conventional device; and

FIG. 7 is a perspective view of a gable top type paper container with a pouring spout in a top inclined surface.

PREFERRED EMBODIMENT OF THE INVENTION

FIGS. 1 to 5 show one example of the embodiment. In FIG. 1, a container body 1 of a paper container is intermittently transported by a transport device on the machine bed not shown. The container body 1 in the state where an upper end thereof is an opening 2 and a pouring spout mounting hole 4 is formed in one side surface 3 is stationary at a position X on the transport device not shown.

Above the opening 2 of the container body 1 at the position X, an aligning feed chute 6 of a pouring spout 5 is fixedly arranged on the machine bed not shown.

As shown in FIGS. 2, 3 and 4, the aligning feed chute 6 is formed between a front plate 7 and a rear plate 8 with a gap 10 for guiding a flange 9 of the pouring spout 5, the front plate 7 being formed with an open window 13 for passing a head 12 screwed into a cap 11 of the pouring spout 5 therethrough over the full length of the front plate 7.

An open window 14 is formed over the full length of the rear plate 8. This open window 14 forms an opening for removing in which a sucker as a holding portion 15 described later sucks the back of a flange 9 of the pouring spout 5.

In FIG. 1, on an arm 16 extended and hung from the aligning feed chute 6 are mounted a first air cylinder 18 having a first stopper 17, a second air cylinder 20 having a pressing element 19, and a third air cylinder 22 having a second stopper 21, the first stopper 17 causing the pouring spout 5 to wait for directly above the open window 14 as a work window, the second stopper 21 holding the pouring spout 5 at a position corresponding to the open window 14 as an opening for removing, the pressing element 19 pressing the pouring spout 5 held by the second stopper 21 against the holding portion 15 to positively hold it.

A support arm 23 having a sucker as the holding portion 15 at the lower end thereof is disposed directly above the opening 2 of the container body 1.

A plunger 26 is vertically secured and arranged by means of brackets 24 and 25 to the aligning feed chute 6 secured and arranged on the machine

bed not shown, an air cylinder 27 extends through the plunger 26, and the air cylinder 27 is reciprocated in a direction indicated at arrow Y by supply and discharge of compression air.

A support frame 28 is secured to the air cylinder 27, and the support arm 23 is inserted into guide rods 29 and 30 fixedly arranged horizontally at both upper and lower positions of the support frame 28 so that the support arm 23 can be reciprocated in a direction indicated at arrow Z. On the other hand, an air cylinder 31 is fixedly disposed on the support frame 28, and the support arm 23 is secured to a plunger 32 thereof.

A lower end 33 of the support arm 23 is bent into an inverted Z or an crank shape and projected toward the aligning feed chute 6, and the holding portion 15 as a sucker is secured to the front surface of the lower end 33.

The aforementioned plunger 26 and the air cylinder 27 constitute a drive device for reciprocating the holding portion 15 in a direction indicated at arrow Y through the support arm 23, the holding portion 15 being opposed to the opening for removing of the aligning feed chute 6 at a stroke end which is the up limit of the air cylinder 27 and opposed to the pouring spout mounting hole 4 of the container body 1 at an approach end which is the down limit.

The aforementioned air cylinder 31 and the plunger 32 constitute a drive device for reciprocating the holding portion 15 through the support arm 23 in a direction indicated at arrow Z between two positions, a position opposed to the pouring spout mounting hole 4 of the container body 1 and a position for inserting the pouring spout into the mounting hole 4.

As the result, the holding portion 15, as shown in FIG. 5, moves down from a position G opposed to the open window 14 of the aligning feed chute 6 to a position H opposed to the pouring spout mounting hole 4 of the container body 1, moves from the position H to a position I for inserting the pouring spout 5 into the mounting hole 4, returns from the position I to the position H, and returns from the position H to the original position G again. Therefore, the holding portion 15 can complete all the steps by only four operations.

While in the illustrated embodiment, a sucker is used as the holding portion 15, and only a communication hole 34 for exerting negative pressure is shown in FIGS. 2 and 3, it is to be noted of course that any other constitutional elements may be used as the holding portion 15.

The drive device for the support arm of the holding portion is not limited to the configuration of the present invention but may be of a single drive device.

In FIG. 1, reference numerals 35 and 36 denote

pieces for adjusting the insert depth of the pouring spout 5 into the mounting hole 4 by the holding portion 15, that is, the stroke length of the plunger 32 in a direction indicated at arrow Z.

The present invention has the configuration and effect as described above. The operation for inserting the pouring spout into the pouring spout mounting hole of the container body from the inside of the container body can be completed by simple four operations comprising upward and downward movements and horizontal forward and backward movements. Therefore, there is an effect that insertion of the pouring spout is carried out evenly and positively within a limited time for mounting the pouring spout during the step for continuously assembling a paper container at high speed.

Claims

1. An apparatus for inserting a pouring spout (5) to a container comprising an aligning feed chute (6) for feeding pouring spout (5), a holding portion (15) for holding the pouring spout (5) and a drive device coupled to a support arm (23) of the holding portion (15) for moving the holding portion (15), the aligning feed chute (6) being arranged upwardly of an upper end opening (2) of the container body (1) of the container having a pouring spout mounting hole (4) in a side surface (3) thereof, the holding portion (15) being disposed directly above the opening (2) of the container body (1), characterized in that the drive device reciprocates the holding portion (15) in vertical directions (Y) between a position opposed to an opening (14) for removing the pouring spout (5) of the aligning feed chute (6) and a position opposed to the pouring spout mounting hole (4) of the container, and further reciprocates the holding portion (15) in horizontal directions (Z) between a position opposed to the pouring spout mounting hole (4) of the container body and a position for inserting the pouring spout (5) into the pouring spout mounting hole (4).

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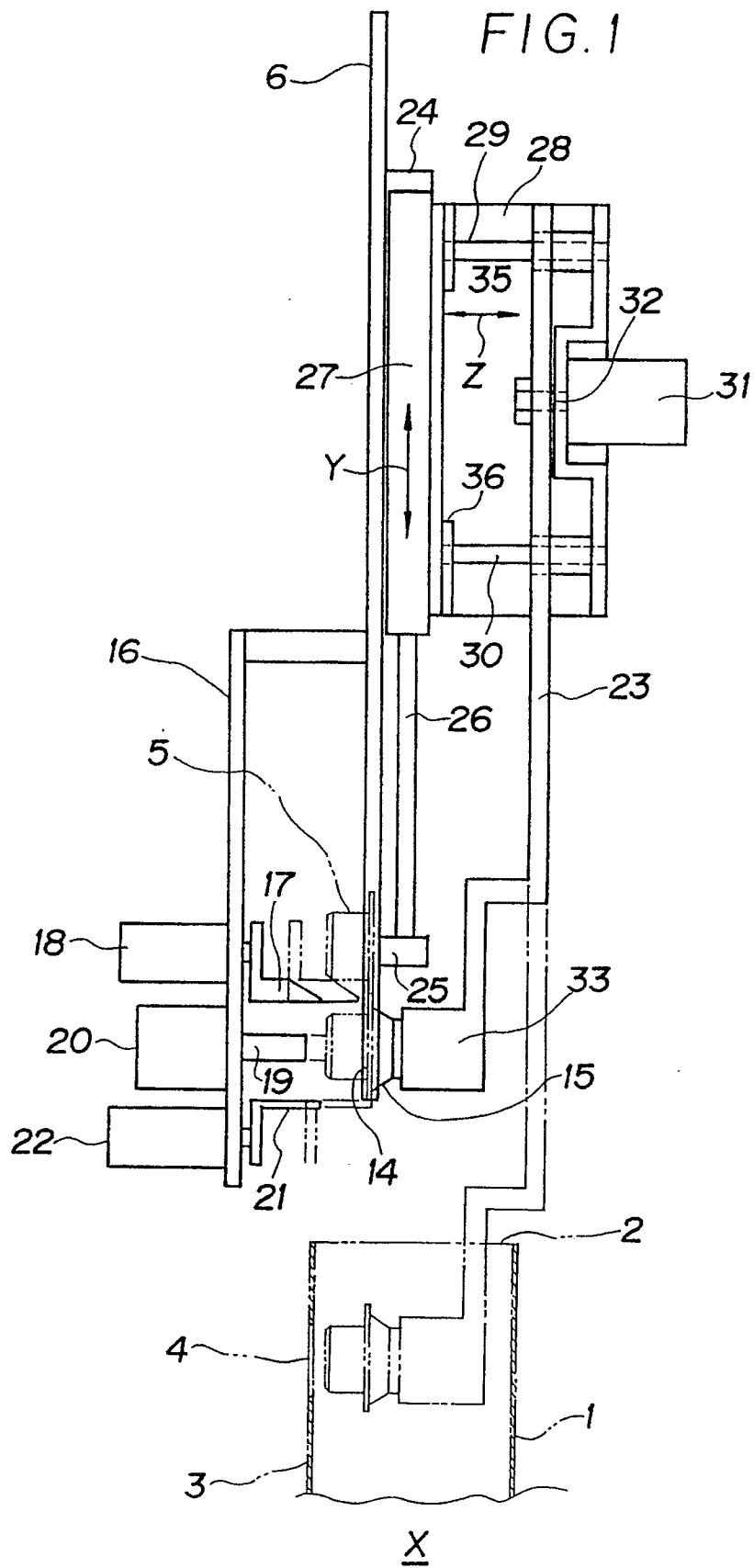


FIG. 2

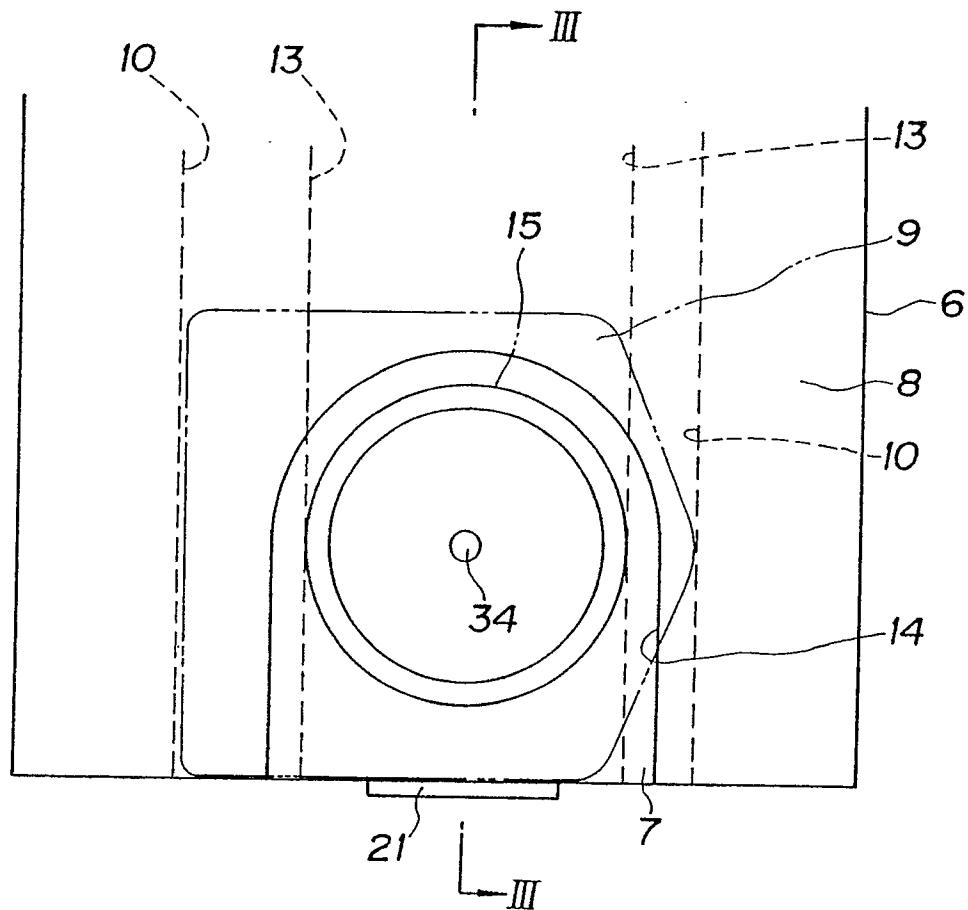
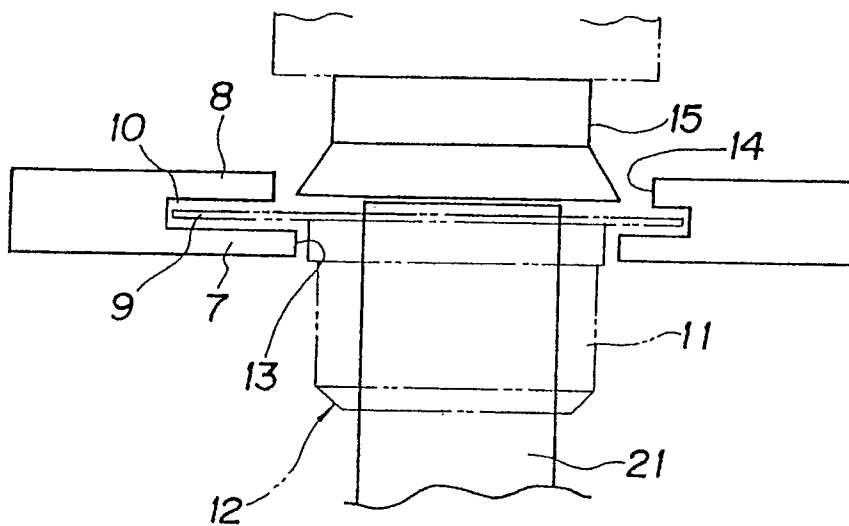


FIG. 4



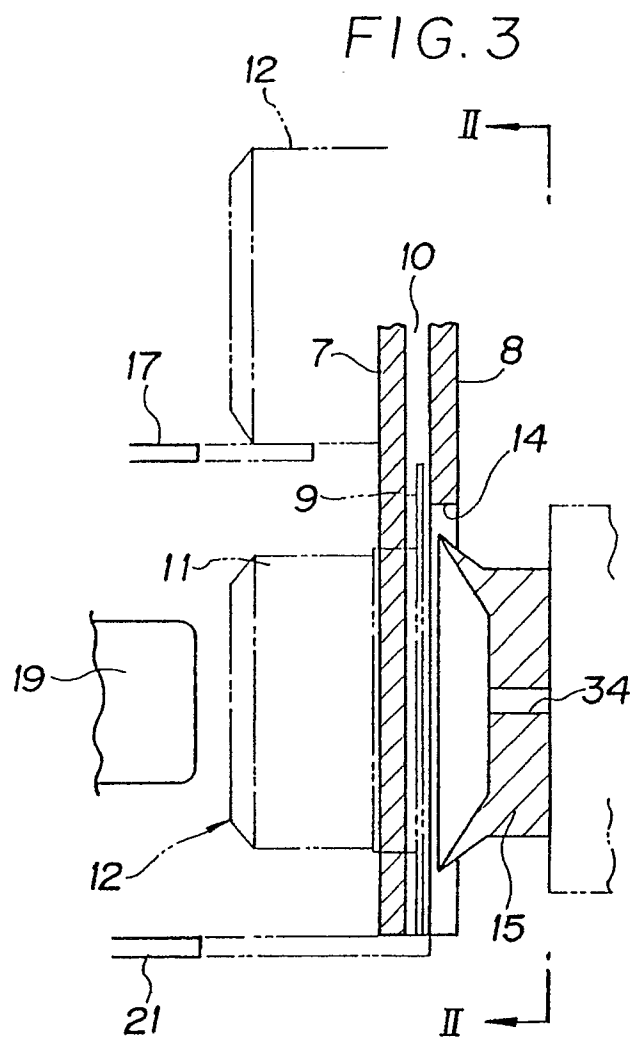


FIG. 5

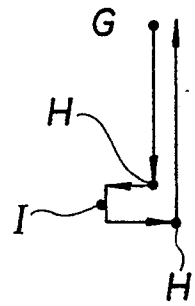


FIG. 6

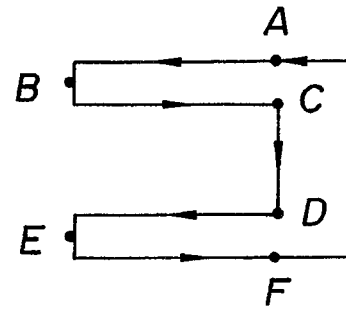
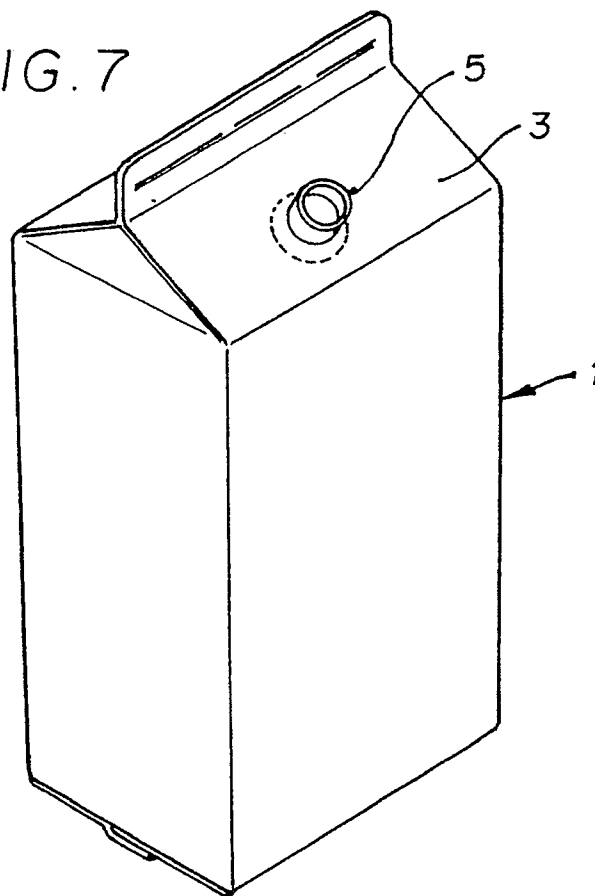


FIG. 7





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EUROPEAN SEARCH REPORT

Application Number

EP 90 31 1615

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4788811 (KAWAJIRI ET AL.) * column 4, lines 43 - 46; figures 32-34, 40 *	1	B31B1/84
A	GB-A-2112344 (SHIBUYA KOGYO CO.)		
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B67B B31B
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 29 JANUARY 1991	Examiner SPETTEL, J.D.M.L.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			