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(54) **MACHINE FOR THE AUTOMATIC DISPENSING OF PROTECTIVE, SEPARATION DIVIDERS FOR GROUPS OF BOTTLES WHICH IS INTENDED FOR BOTTLE PACKAGING LINES**

(57) The invention relates to a machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines. The invention comprises a continuous op-

eration machine which is used to automate the formation of the spatial structure of the separation dividers and the distribution of said protective, separation units in bottle packaging lines.

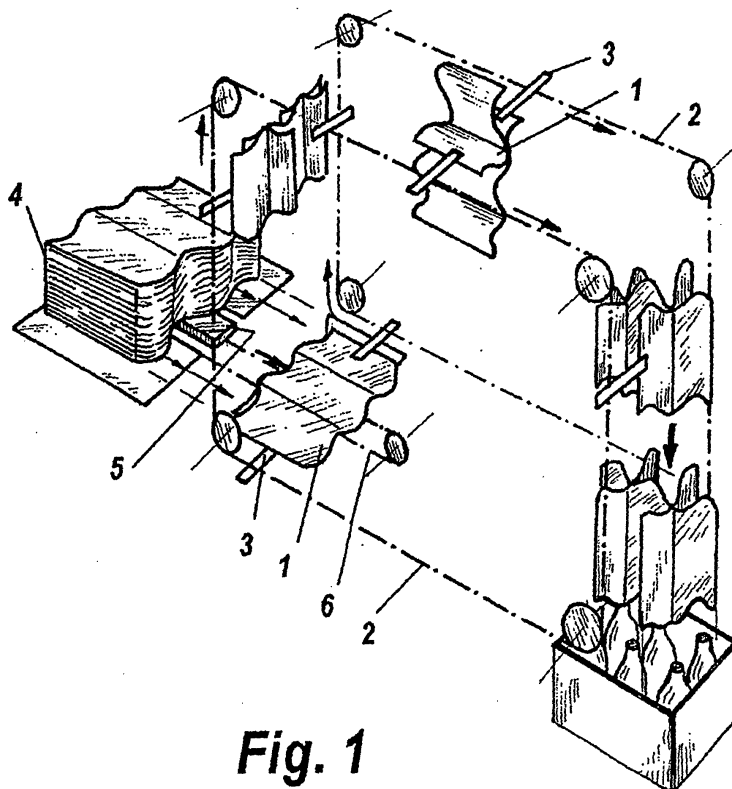


Fig. 1

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Description

[0001] The present invention refers to a machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines.

[0002] Bottle packaging industry has employed numerous systems for preventing the breakage and damage of bottles caused by their clinking together when being packaged in boxes intended for containing groups of bottles, as well as by their transport, storage and distribution.

[0003] The same problem occurs with bottle labels. During transport fortuitous rubbing of bottles against each other causes the damage of the labels, which renders them unusable. For this reason this industry has developed systems for protecting packaged bottles.

[0004] Straw hoods slipped on every bottle, for instance, have been employed. Wood shavings and other materials have also been used as shock-absorbing beds for bottle boxes. A further arrangement consisted in using inner frames made of cardboard or fibers that create independent housings in the boxes intended for containing groups of bottles.

[0005] All the above solutions, owing to their complexity, pose serious problems when it comes to mechanizing the packaging process.

[0006] Other solutions consist in employing analogous procedures to bottle labeling in order to sheath the bottles with protecting materials, such as corrugated cardboard. Spanish Patent 2110346, for instance, describes a machine featuring the above characteristics that manages to solve the problem of mechanizing bottle packaging and also provides bottle protection. The disadvantage of this type of machines is that they are complex and costly.

[0007] There exist in the market separation dividers intended to provide the packaging of groups of bottles with reticular spatial structures capable of lodging the bottles preventing thereby the damage thereof caused by mutual contact. Among these separation dividers are those described in Spanish Patents N° 9400980 and N° 9601786, consisting of an assembly of reticular dividers storable in the form of sheets folded upon themselves.

[0008] The disadvantage of these protective separating units is that they are to be inserted by hand in the packages of groups of bottles. Therefore, operators have to remove the sheets from the storage pack, unfold them and insert them in the packaging having to overcome at the same time the tendency of the separation divider to fold back. The insertion is hence slow-going and cumbersome.

[0009] The object of this invention is intended to solve the above disadvantages, the said invention consisting of a continuous operation machine that automates the formation of the spatial structures for the separation dividers and the dispensing of the said protective separating units in packaging lines for groups of bottles.

[0010] The machine of the present invention is highly multifunctional and can be easily adapted to several analogous separation dividers, through the selection of suitable guiding bodies. Further, it can dispense separation dividers both, in the interior of boxes, which can be empty of bottles or not, or in a loose condition for further inserting bottles and thereafter introducing the assembly in boxes or in groups of bottles that shall subsequently be placed in their corresponding box or packaging.

[0011] With the continuous operation of the machine object of the invention what is achieved is both a high performance as far as the number of separation dividers supplied by time unit and the low costs in the manufacture and processing of the said dividers is concerned.

[0012] A practical embodiment of the machine of the invention is described further down by way of non-limiting example below, there being appended 3 sheets of drawings, in which Figure 1 is a schematic representation of the travel made by the machine carrying a separation divider from the moment of removal thereof from the storage pack to the insertion thereof in the packaging for groups of bottles.

[0013] Figure 2 is a partial perspective view of the machine of the invention that shows a detail of both the machine's removal mechanism of separation dividers from the storage pack and the fastening mechanism of the said separation dividers.

[0014] Figure 3 is a lateral view of the removal mechanism of separation dividers from the storage pack.

[0015] Figure 4 is a detail of the frame expanding mechanism of the machine of the invention.

[0016] Figure 5 is perspective view of a gripping claw in accordance with one the preferred embodiments of the invention.

[0017] Figure 6 is a perspective view of the machine showing the guiding bodies for the final alignment of the separation dividers.

[0018] The machine object of the present invention comprises a frame or fixed support (15) along which endless motor-driven chains (2) move, not shown. On the said endless chains (2) are arranged the gripping claws (3) for the separation dividers (1), such that a continuous processing circuit is formed (Fig 1), which circuit ends with the dispensing of the separation divider (1) spatial structure in the packaging line of the groups of bottles.

[0019] In order to perform this cycle the machine starts from a reticular-shaped separating unit that is folded forming a sheet. This sheet, typically made of cardboard, is supplied to the machine from a storage pack (4).

[0020] The machine of the invention commences its operation by removing, through suitable means, one separation divider from the storage pack that is thereafter positioned in the machine's processing circuit. In a preferred embodiment of the invention, for such purpose it is employed pusher stops (5) that rotate in an endless

chain (6) and push the lower unit located in a storage pack (4).

[0021] The storage pack (4) of separation dividers (1) is provided on the support surface thereof with an aperture (7) which enables the stops (5) to both reach the level of the last unit (1) and push it towards the body of the machine of the invention.

[0022] A movable platform (8) which ensures the separation of the separation divider (1) with respect to the pusher stops (5), as shown in figure 2, in conjunction with a swinging ramp with counterweight (10), as shown in figure 3, contribute to correctly positioning the separating unit (1) in the circuit of the machine. The pusher stops (5) lift the movable platform (8).

[0023] Optionally, in a development of the present invention, a double open strip (11), shown in figure 3, acts as final stop and positions the separating unit in the starting position thereof in the circuit associated with the endless chains (2).

[0024] The machine object of the invention is provided with means for opening the claws (3) such as respective guides (12) that mechanically force them open.

[0025] The claws (3) further carry attached to the jaws thereof point-shaped guiding elements (13), as shown in figure 2, that perform a first opening of the separating unit laps so as to allow the claw (3), once opened, to grip only a suitable portion of the unit (1).

[0026] In another construction of the present invention, the claws (3) have the ends (17) thereof outwardly bent, as shown in figure 5, which permits an easy reception of the separation dividers (1). A strip (18) joining the jaws of the claws, maintains their closure tension, so that whenever the guides (12) are not exerting pressure toward the aperture of the claws, the strip (17), owing to the elastic inertia thereof, closes the jaws of the said claw (3).

[0027] The aforesaid claws (3) placed at one of the two sides of the machine are also provided with guiding means for the separation dividers (1). The said means consists in that to the claw (3) is attached an angle-shaped elbow (9), see figure 5, which, whenever the claw (3) grips the separation divider (1), permits the separation of the laps from the separation divider (1) facilitating the introduction of tips of the guiding bodies (14a).

[0028] The rotation of the endless chains (2) displaces the separation divider (1), now gripped by the claws (3) by means of the machine's processing circuit. As shown in figures 2 and 4 provision is made for stop and guiding bodies (14a, 14b and 14c), that when brushing against the moving separating unit and thanks to the special shape of the said stop and guiding bodies (14a, 14b and 14c), the said sheet-shaped separating unit (1) unfolds until to become a reticular spatial structure, then rotates the laps thereof from side to side about 180° so as to overcome the tendency to fold back in the shape of a sheet and, finally, becomes positioned ready for placement in the final packaging.

[0029] The number, shape and disposition of these

guiding and processing members (14a, 14b and 14c) of the separation dividers (1) are dependant upon the size and consistency of the separating units.

[0030] Hence, some units (1) require an inverse folding so as to weaken the rigidity of the structure thereof and avoid that, once properly positioned in place due to their inertia, they tend to resume their original folded condition, which would hinder their proper insertion in the box carrying the group of bottles.

[0031] The guiding bodies responsible for the weakening process of the separating unit (1) structure are shown, in a preferred embodiment of the invention, in figures 2 and 3, and receive numerals 14a and 14b.

[0032] The guiding bodies responsible for the final positioning of the separation dividers (1), ready now for being dispensed, are shown in figure 4 and all receive numeral 14c.

[0033] Guiding bodies (14a, 14b and 14c) are in a suitable shape for the function of guiding process and handling required in any given case.

[0034] Provision is made in a preferred embodiment of the invention for the machine to be adaptable to several sizes and similar types of separation dividers (1). To that effect one of the sides of the frame (15) is provided with a movable wall (16) that adapts the capacity of the machine to larger units (1). In the figures appearing in the sheets of drawings, the said enlargement is shown. In order to adapt the size of the machine, it suffices to displace the movable wall (16) and to replace the guiding bodies elements (14a, 14b and 14c) by those suitable for the new type of separating unit (1).

[0035] The processing circuit of the machine of the invention can take place in an automatic way and can be controlled by a microprocessor that monitors each step and decides when and whether each separation divider (1) is to be positioned and that controls both the rotation of the endless chains (2 and 6) and the aperture/closure of the claws (3).

[0036] The machine of the present invention performs the process with a continuous operation. The construction thereof is such that it is not necessary to stop the cycle of the machine in order to perform any of the handling processes of the separating units (1).

Claims

1. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, **characterized in that** it comprises a frame (15) along which endless chains (2) move, which endless chains (2) incorporate gripping claws (3) for the separation dividers (1), forming a continuous processing circuit of same, and guiding bodies (14a, 14b and 14c) located in the said frame (15), whose shape is suitable for opening the laps of the said units (1) thereby forming the particular reticular spatial structure of

same, being the said machine further **characterized in that** it rotates the said laps in either direction and **in that** it aligns the said separation dividers (1) in the successive packaging line.

2. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to claim 1, **characterized in that** it is provided with both removing means for unitary separation dividers (1) from the storage pack (4) and placement means of such separation dividers in the continuous circuit. 10
3. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to the previous claims, wherein the said removal and placement means consist of pusher stops (5) that are dragged along by a endless chain (6), and a movable platform (8) in conjunction with a swinging ramp with counterweight (10). 15 20
4. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to the previous claims, **characterized in that** it is provided with a double open strip (11) located at the beginning of the processing circuit. 25 30
5. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, **characterized in that** it is provided with opening and closing means, such as guides (12), for the gripping claws (3). 35
6. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to the previous claims, **characterized in that** the said gripping claws (3) have the tips thereof (17) opened outwardly and are provided with a bent angle (9) on the said claws (3). 40 45
7. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to claims 1 to 5, **characterized in that** attached to the jaws of the said gripping claws (3) are guiding elements (13). 50
8. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to the previous claims, **characterized in that** the frame (15) of the machine is provided with a movable side wall (16) for adapting the width of the ma- 55

chine as well as the number, shape and position of the guiding bodies (14a, 14b and 14c).

9. Machine which automatically dispenses protective, separation dividers for groups of bottles and which is intended for bottle packaging lines, according to the previous claims, **characterized in that** it incorporates a unit for controlling and monitoring the process that is governed by a microprocessor.

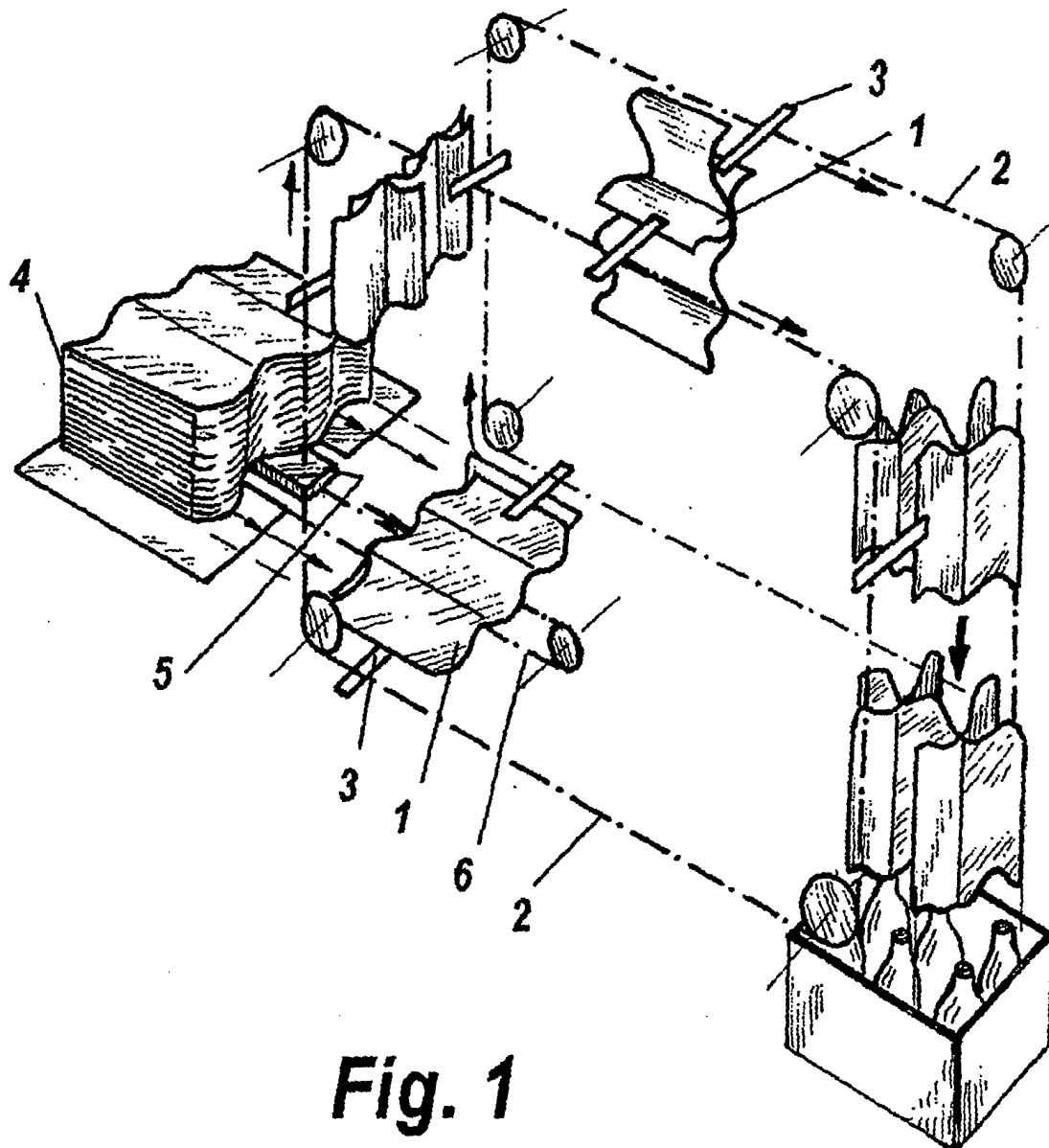


Fig. 1

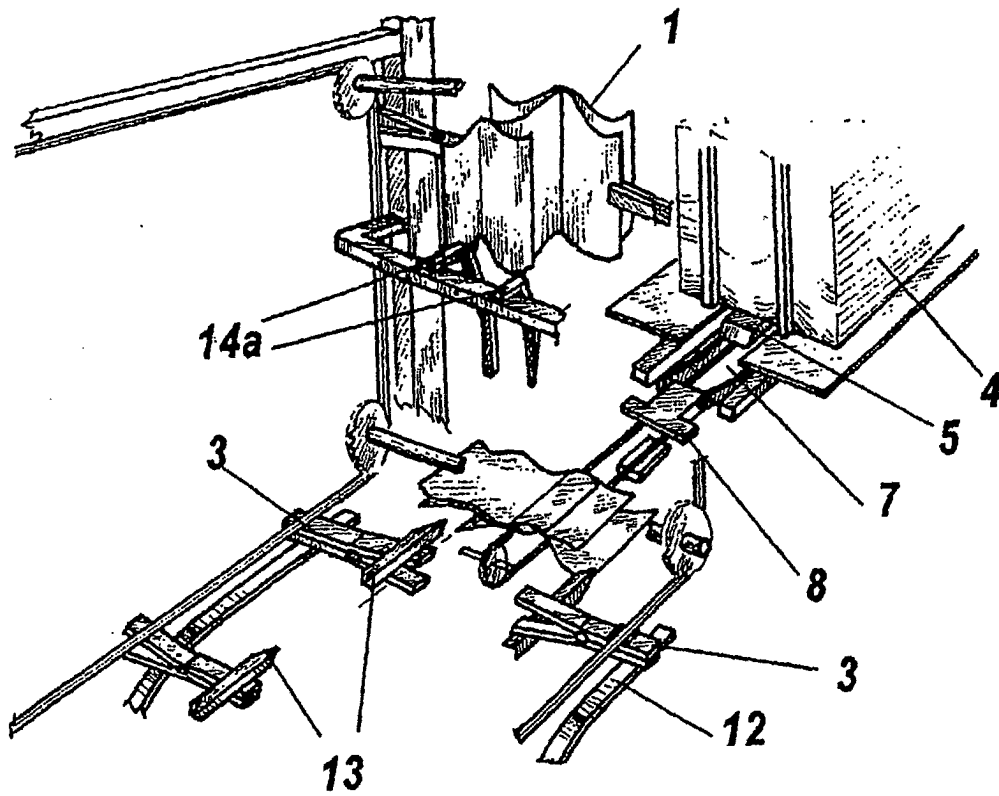


Fig. 2

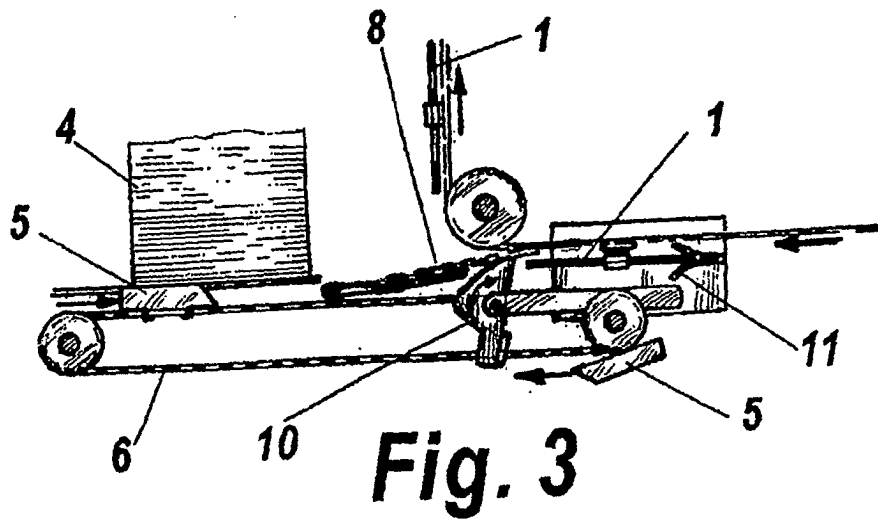


Fig. 3

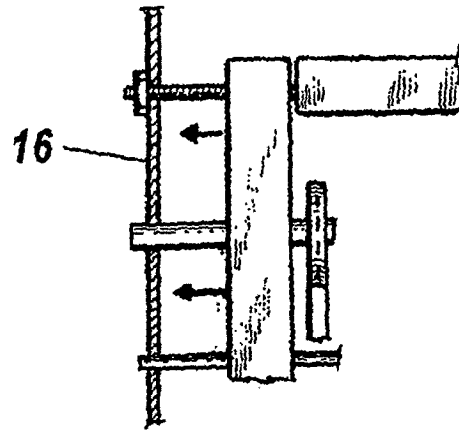


Fig. 4

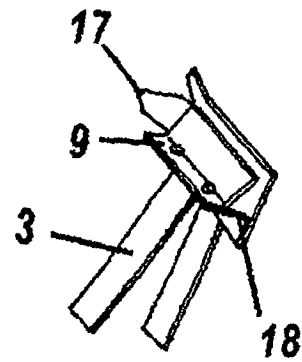


Fig. 5

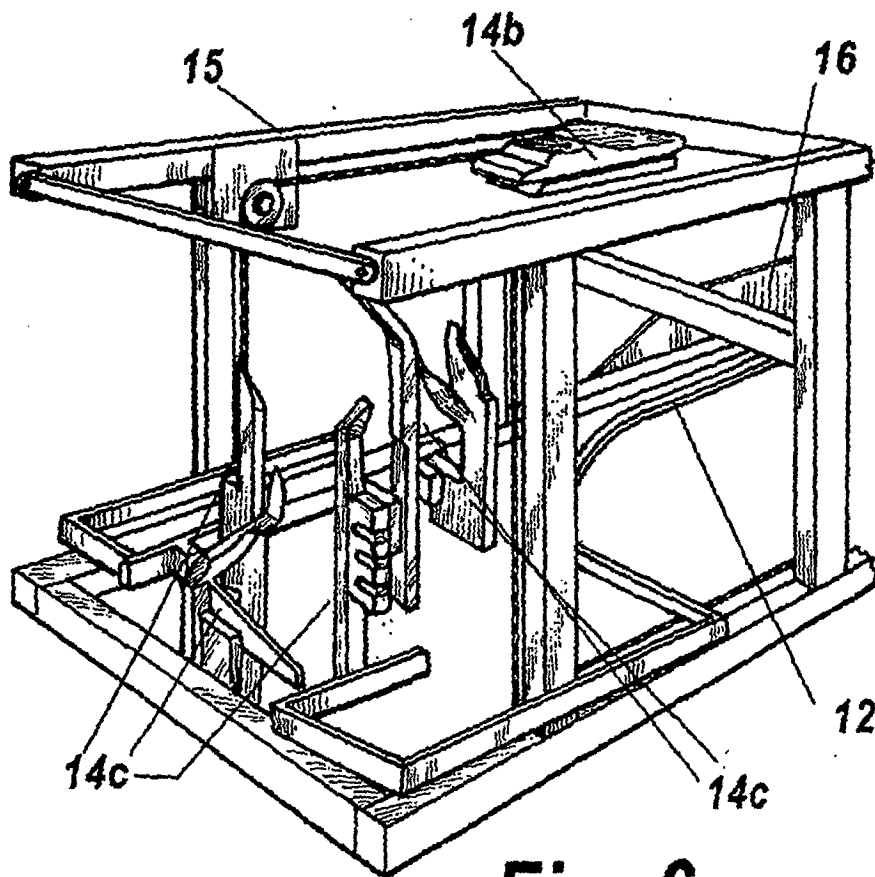


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 02/ 00502

A. CLASSIFICATION OF SUBJECT MATTER		
INT. cl7 B65B61/20		
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)		
INT. cl7 B65B		
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)		
EPODOC, CIBEPAT, WPI, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US-3483802-A (Heyne) 16.12.1969 column 2, lines 37-51, figure 1	1,2
Y	EP-0032786-A1 (Encase Ltd.) 29.07.1981 page 14, line 18 - page 15, line 12; pages 17, line 19- page 18, line 1	1,2
A	WO-96/31393-A1 (Riverwood International) 10.10.1996 the whole document	1-9
A	US-4829747-A (Johnson, Jr. et al.) 16.05.1989 the whole document	1-8
A	US-3680278-A (Pearson) 01.08.1972 abstract; figures	1,2
☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
12 February 2003 (12.02.03)		18 February 2003 (18.02.03)
Name and mailing address of the ISA/ S.P.T.O.		Authorized officer
Facsimile No.		Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/ ES 02/ 00502

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