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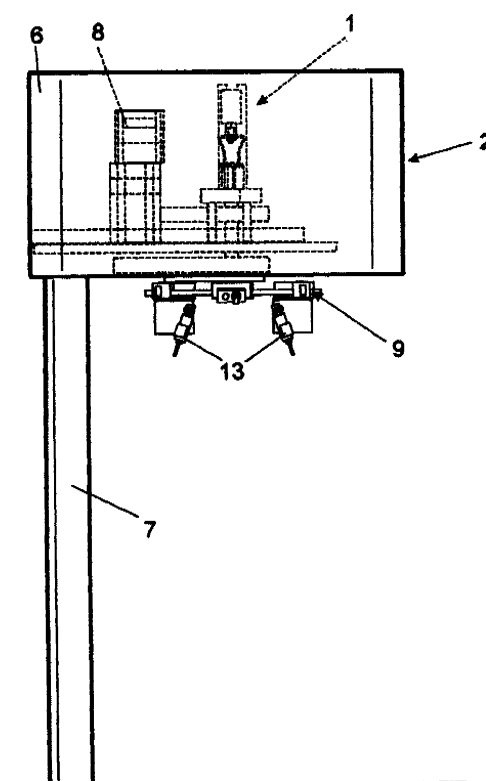
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(54) **HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS**

(57) The invention relates to a high-speed sticking unit for container lids, applicable to a polar robot (2) for spraying liquid adhesive or other fluids along a pre-defined edge, comprising a central rotary element (3) for supplying fluid and an outer rotary element (4) for supplying a signal, which are connected to a main rotary shaft (5) and to the control means (8) of the robot. There is also a lower rotary block (9) with the outflow (10) of the fluid and electrical signal towards the product applicator pistols which are set with means for adjusting the turn radius thereof and the incline thereof. The invention also relates to a configurable cleaning station (15) which is arranged in the vicinity of the applicator pistons (13).

FIG. 2



Description

OBJECT OF THE INVENTION

[0001] The invention, as stated the title of the present specification, relates to a high-speed sticking unit for container lids, which provides a number of innovative structural and constituent features, which will be described in more detail later, which entail a novelty within its field of application.

[0002] More particularly, the object of the invention is focused on a unit applicable to polar robot, and the specific purpose of which is to become a high-speed system for the application of rubber in the lip of metal container lids, allowing achieving a spraying of liquid adhesive or other fluids along a defined edge, an operation for high lid outputs, keeping the lid stationary during the half of the cycle, tilting the projection, if required, preventing the change of format for different lid diameters or geometries, and providing an automatic cleaning system.

FIELD OF APPLICATION OF THE INVENTION

[0003] The field of application of the present invention falls within the sector of manufacturers of packaging and metal-graphics industries, focusing particularly on the scope of systems for applying rubber or other fluids at the edge of metal container lids

BACKGROUND OF THE INVENTION

[0004] As a reference to the current state of the art, it should be noted that, even though it is known the application of sprayed rubber on the edge of container lids, the currently used systems have a series of limitations that make the work slow in certain circumstances or the head should be changed whenever the model or size of the lid is switched, the difficulty of cleaning of the product applicator nozzles being also a problem.

[0005] The aim of the present invention is therefore to develop an improved system of application of said rubber that prevents the previously described drawbacks and allows a high-speed application by the use of a polar robot, allowing, consequently, improving the production costs.

[0006] It should be noted, on the other hand that, at least by the applicant, it is unaware the existence of any other high-speed sticking unit for container lids or any other invention that has technical, structural, and constituent characteristics similar to those here proposed and as claimed.

EXPLANATION OF THE INVENTION

[0007] Thus, the high-speed sticking unit proposed by the invention, is configured as a noteworthy novelty within its field of application, since according to its implementation and as a limitation, the previously designated aims

are achieved satisfactorily, while the characterizing details thereof are conveniently collected in the final claims that accompany this description.

[0008] In particular, said unit that, as stated, is applicable to polar or spherical robot, the operation of which is based on the application of a polar coordinate system, comprising essentially a central rotary element for supplying the fluid product, under which an outer rotary element is coupled for supplying the electric signal, being both connected to a main rotary shaft that is conveniently attached to the body of the robot.

[0009] At the same time, the unit has, connected to the lower end of the aforementioned main shaft, an also rotary block designed as a corrector of the turn radius in which product applicator pistols are coupled inserted in means with which its position with respect to the center of said block can be varied, and set so that they can be also tilted in various positions within a particular range; in addition, a cleaning station can be attached to them, existing between them, in the centre of said block the outflow of signal and fluid to be driven towards the applicator pistols.

[0010] Even so, there are envisaged two or more concentric shaft that revolve in a synchronized manner, the main shaft and the lower rotary block, allowing, by combination of them, describing any type of trajectory in two or three dimensions, without require changes of format, regardless of the dimensions and geometry of the edge of the lid to which the sticking will be applied.

[0011] This fact allows the layout of any type of profile without exchanging parts. Movements of rotation and displacement can be controller synchronously in such a way that the drop-projection accelerations remain constant.

[0012] The rotary block can have one or more pistols. This is possible because the rotational movement is carried out from the center of this block. Said pistols, in addition, can move synchronously, electrically or mechanically, this synchronization being independent or linked, depending on the number of shafts and the needs in each case.

[0013] The main advantage that provides is that it allows reducing the centrifugal and linear accelerations of drop projected for an equal number of paths per minute.

[0014] It should be noted, moreover, that these pistols can have a certain adjustable angle of tilt that facilitates the application of the product. This allows, advantageously, the control of the approximate angle of incidence on the lip within margins.

[0015] The unit includes, as noted at the beginning of this section, rotary systems, a central one and the other outer, for supplying gases, fluids, and current to the area of application, i.e. to application pistols. These systems allow, advantageously, the activation of signals, power and supply of material to the pistols and to outflow of signal without causing vibrations in tubes or wires that could cause defective applications.

[0016] Finally, the unit envisages a cleaning station located next to the area of application, which allows the

cleaning of pistols and dosing system in a configurable way, even after each cycle. This provides the advantage of maintaining in perfect conditions the nozzle of dosing pistols to prevent blockages thereof.

[0017] The unit described thus allows reaching the aims of:

- spraying with liquid adhesive or other fluids along a pre-defined edge;
- achieving high lid outputs due to high rates of work achieved;
- keeping the lid stationary during the half of the cycle when applying the product with two or more pistols at a time on the lip of each lid;
- being able to incline the projection of the spraying of liquid adhesive or other fluids to direct it towards the outside of the lip of the lid;
- eliminating the need of making changes of format for different measures or geometries of piece;
- having an automatic cleaning system of a selectable way, being able to configure it to perform a cleaning per cycle of work.

[0018] In the light of the above, it is found that the described high-speed sticking unit for container lids represents an innovation of structural and constitutive characteristics unknown so far to this end, reasons which in combination with its practical utility, provide it with enough basis to obtain the exclusivity privilege which is applied for.

DESCRIPTION OF THE DRAWINGS

[0019] In order to complement the description that is being carried out and with the object to help to a better understanding of the invention, a set of drawings is attached to the present specification, as an integral part thereof, in which, with an illustrative and non-limiting character, the following has been represented:

Figure 1.- It shows a schematic elevation view of an example of the high-speed sticking unit for container lids, subject of the invention, appreciating in it the main parts and elements which it comprises.

Figure 2.- It shows an elevation view of the polar robot with the sticking unit, according to the invention, built-in to the same, appreciating the arrangement of all its elements.

PREFERRED EMBODIMENT OF THE INVENTION

[0020] In light of the previously mentioned figures, and according to the numeration adopted, a non-limiting example of the proposed sticking unit can be seen therein, which comprises the parts and elements which are indicated and described in more detail below.

[0021] Thus, as seen in said figures, the unit (1) in

question comprises, coupled to a polar robot (2), a central rotary element (3) for supplying fluid to be applied and an outer rotary element (4) for supplying the signal, connected to a main rotary shaft (5) which, arranged within a protective housing (6) that is located elevated on a lateral support (7), are connected to the actuation and control means (8) of the robot (2).

[0022] Moreover, connected to the lower end of the main shaft (5), has a lower rotary block (9) in the center of which the outflow (10) of the fluid and electric signal is located, from which adjustable position means start, for example horizontal bars (11), to which ends the supports (12), into which the product applicator pistols (13) are incorporated, are coupled, such that by means of said bars or other adjustable coupling means the turn radius thereof can be adjusted depending on the dimensions of the lid (not shown) to which the sticking will be applied.

[0023] Likewise said applicator pistols (13), in turn, are incorporated into said supports (12) with movable fasteners (14) that enable the adjustment of its incline, within a range, to control the angle of incidence over the lip of the lid as appropriate in each case.

[0024] Finally, the proposed unit (1) also envisages a cleaning station (15) which, also associated with the control of the robot (2) for its placement in use or rest position, is arranged in the vicinity of the applicator pistols (13), allowing the cleaning thereof in a configurable manner.

[0025] Having sufficiently described the nature of the present invention, as well as the way of putting it into practice, it is not considered necessary to further extend its description for any person skilled in the art to understand its scope and the advantages derived therefrom, stating that, within its essence, it can be put into practice in other embodiments which differ only in detail from the one indicated by way of example, and which are also covered by the protection which is sought provided that its fundamental principle is not altered, changed or modified.

Claims

1. HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS, that applicable to a polar robot (2) for spraying liquid adhesive or other fluids along a pre-defined edge, is **characterized in that** it comprises at least one central rotary element (3) for supplying fluid and an outer rotary element (4) for supplying the electric signal, connected to a main rotary shaft (5) and to the actuation and control means (8) of the robot (2), and there is also, associated with said main shaft (5), a lower rotary block (9) with the outflow (10) of fluid and electric signal towards the incorporated product applicator pistols (13) set with means that allow for adjusting the turn radius thereof and the incline thereof.

2. HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS, according to claim 1, **characterized in that** it further contemplates a cleaning station (15) related to the control of the robot (2) to configure its operation, which is arranged in the vicinity of the applicator pistols (13). 5
3. HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS, according to claim 1 or 2, **characterized in that** in the center of the lower rotary block (9) is located the outflow (10) of the fluid and electric signal from which the adjustable position means start the ends of which the supports (12) into which the product applicator pistols (13) are incorporated, are coupled. 10 15
4. HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS, according to claim 3, **characterized in that** the applicator pistols (13) are incorporated into said supports (12) with movable fasteners (14) that enable the regulation of its incline within a range. 20
5. HIGH-SPEED STICKING UNIT FOR CONTAINER LIDS, according to any of claims 1-4, **characterized in that**, at least, the central rotary element (3) for supplying fluid and the outer rotary element (4) for supplying the signal, connected to the main rotary shaft (5), are arranged within a protective housing (6). 25 30 35 40 45 50 55

FIG. 1

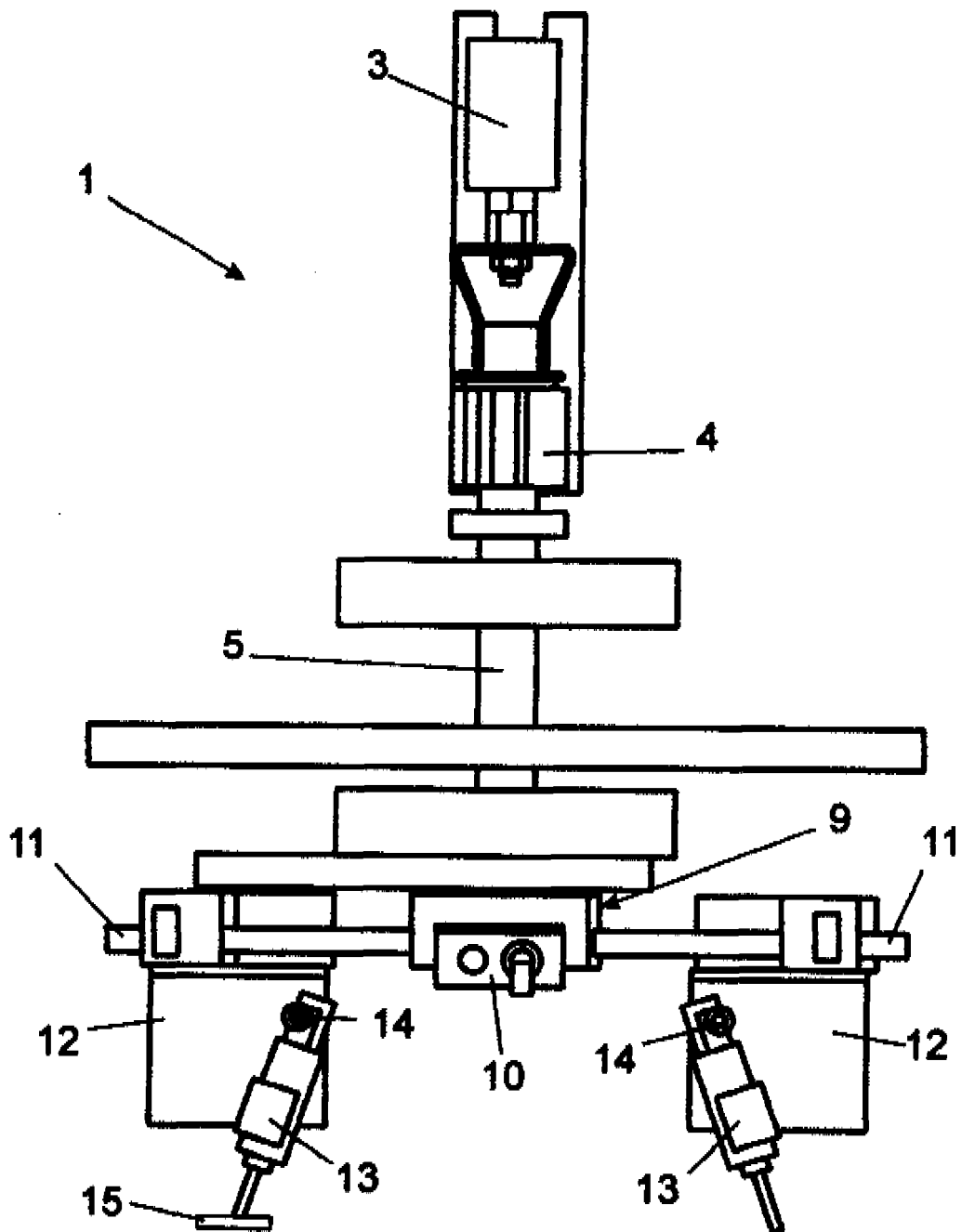
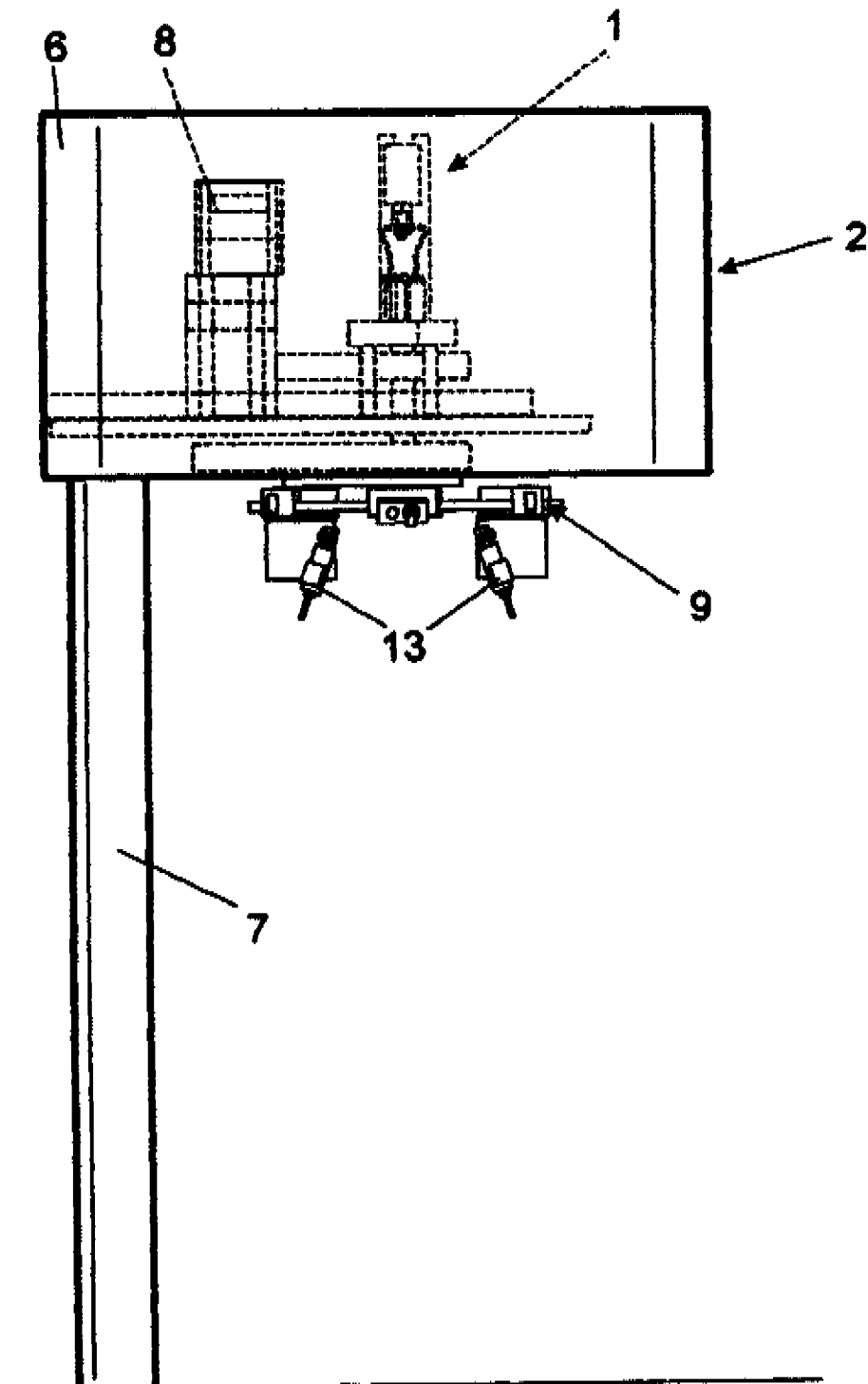


FIG. 2



INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2014/000022

A. CLASSIFICATION OF SUBJECT MATTER

B67B1/03 (2006.01)

B05B13/04 (2006.01)

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)

B67B, B05B

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, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2006050855 A1 (ITALCO S.R.L.) 18.05.2006, page 8, line 22 – page 9, line 14; figure 4.	1,3-5
Y	WO 9317182 A1 (FORMICA ESPAÑOLA, S.A.) 02.09.1993, page 9, line 12 – page 12, line 2; figure 3.	1,3-5
A	US 6132809 A (PREC VALVE & AUTOMATION INC) 17.10.2000, the whole document.	1-5
A	FR 2685315 A1 (PRETEUX BOURGEOIS; POITEVIN PHILIPPE) 25.06.1993, the whole document.	1-5
A	US 1710953 A (WROUGHT IRON RANGE COMPANY) 30.04.1929, the whole document.	1-5

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	"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
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"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No.

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Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
WO2006050855 A1	18.05.2006	EP1824774 A1 CN101065318 A ITTO20040783 A1	29.08.2007 31.10.2007 09.02.2005
----- WO9317182 A1	02.09.1993	TW254891B B NO933851 A FI934726 A JPH06218300 A JP2653746B B2 CN1084786 A NZ247012 A KR100243722B B1 EP0583463 A1 CA2090553 A1 AU3384093 A ES2050598 A1 ES2050598 B1	21.08.1995 23.12.1993 26.10.1993 09.08.1994 17.09.1997 06.04.1994 26.03.1996 01.02.2000 23.02.1994 28.08.1993 02.09.1993 16.05.1994 01.12.1994
----- US6132809 A	17.10.2000	US6447847 B1	10.09.2002
----- FR2685315 A1	25.06.1993	NONE	
----- US1710953 A	30.04.1929	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)