



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 641 006 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

29.03.2006 Bulletin 2006/13

(51) Int Cl.:

H01H 9/02 (2006.01)

H01H 13/00 (2006.01)

(21) Application number: **05016389.8**

(22) Date of filing: **28.07.2005**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

Designated Extension States:

AL BA HR MK YU

(30) Priority: **28.07.2004 TR 200401872**

03.09.2004 TR 200402203

27.07.2005 IT MI20050274 U

(71) Applicant: **Emas Elektroteknik Makina Sanayi Ve
Ticaret A.S.**

Kucukcekmece, Istanbul (TR)

(72) Inventor: **Sanlitop, Gazanfer**

Kucukcekmece

Istanbul (TR)

(74) Representative: **Iskender, Ibrahim**

Destek Patent Inc.

Tophane Ortapazar Cad. No. 7

Osmangazi 16040 Bursa (TR)

(54) Novelty in crane control apparatus

(57) The present invention relates to a speed and direction control apparatus controlling the changes in direction and speed to be traversed by carrier systems, said apparatus comprising a button assembly slot (8) embodied on a supporting body (1); a button (3) positioned in said button assembly slot (8); a button contact block

(4) positioned on said supporting body (1) and under the button (3); and at least one obstruction (11.1) positioned on the orifice that is opened on said button (3), and formed along the inner circumferential surface of a circular formation having essentially a smaller diameter as compared to the diameter of said button (3).

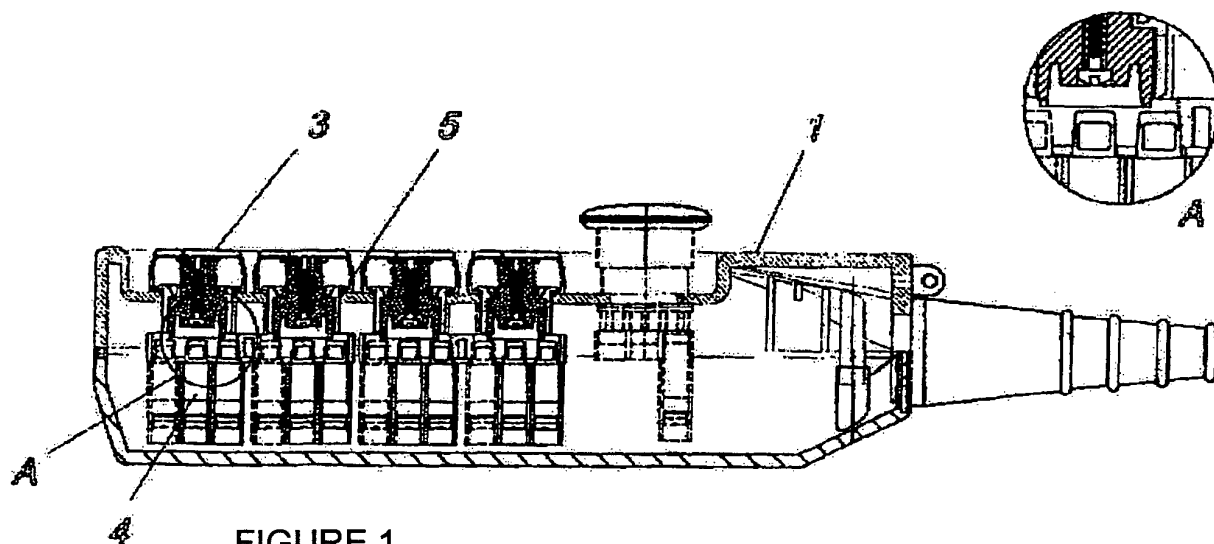


FIGURE 1

EP 1 641 006 A1

Description

Technical Field

[0001] The present invention relates to control apparatuses used in industry.

[0002] The present invention more particularly relates to control apparatuses controlling the direction and speed functions of industrial carrier systems.

Background of Invention

[0003] In a control apparatus embodied for controlling direction and speed functions of carrier systems, at least two orifices are opened on a supporting body, and two detents are formed on the inner walls of each of such orifices. Cylindrical buttons with two contact slots formed circumferentially are positioned on said orifices. Button contact blocks are positioned underneath such button. Thanks to a two-step push-force applied by the button to said button contact block, the step adjustment of the carrier system's speed is carried out. The lower part of such button is made in the form of a smooth surface in order to ensure said step adjustment. The button contact block of the second speed step, among the button contact blocks positioned under said button, is embodied relatively shorter as compared to the other button contact block, or is positioned far from the button. The button with a push-force applied on it, first depresses the button contact block of the first speed step, and provides the system with the first speed step. When the button is pushed again, the lower surface of the button depresses the button contact block of the second speed step, and provides the system with the second speed step. The most significant drawback of this embodiment is the obligation to use a button contact block having a different height or the necessity to position the button contact blocks having the same heights at different distances from the button to provide the speed step, thereby causing to an increase in workmanship and material costs.

[0004] There is a sign on the button, indicating the direction of the translation or move to be provided to such carrier system. By rotating said button on an orifice a half turn around its axis, it is positioned so that the sign on it shows the opposite direction. Said (move) direction changing function is realized by a button in a right- and left-ward manner, by another button in a forward and backward manner, by a third button in a right-forward and left-backward manner, and by another button in a left-forward and right-backward manner.

[0005] Said rotation is made to drive said carrier system in different directions. When it is desired to drive backwards the carrier system that is already driven forward, the forward button is revolved a half turn and is used as the backward button. Said operation is carried out also for other directions. Since it becomes necessary to use a different button for said direction changing operation, the production costs are raised.

[0006] In said embodiment, one channel is formed for each button contact block to allow a relevant user or operator to sense the switches between the speed steps, and a ball is positioned in said channel. Said ball enters into another channel that is perpendicularly opened to the first channel, while the speed steps are switched. While the ball is entered into said channel by means of the push-force of the button, the system is paused or stopped shortly so that the operator senses the change in the speed step. Since such embodiment is applied to each contact block, the cost is increased due to the production of the button contact block.

Brief Description of Invention

[0007] Regarding this current status of the art, the objective of the present invention is to reduce the controlling costs of speed and direction changes of carrier systems by means of an improved apparatus.

[0008] Another objective of the present invention is to provide a control apparatus whereby a user or operator can swiftly and easily change the direction of such carrier systems, thanks to an improved contact of and between the button and button bearing.

[0009] In order to achieve said objectives, a speed and direction control apparatus is developed to control the changes in direction and speed traversed by carrier systems, said apparatus comprising a button assembly slot embodied on a supporting body; a button positioned in said button assembly slot; a button contact block on said supporting body and under the button; an obstruction positioned on the orifice that is opened on the button and formed as a second step speed surface along the inner circumferential surface of a circular formation having essentially a smaller diameter as compared to the diameter of said button.

[0010] In a preferred embodiment of the present invention, a position fixation detent is made on the button.

[0011] In another preferred embodiment of the present invention, eight position fixation channels are positioned making forty-five (45) degrees to the inner wall of said button assembly slot.

[0012] In a further preferred embodiment of the present invention, at least one elastic element is positioned on the channel embodied on the button's center or hub.

[0013] Yet in another preferred embodiment of the present invention, at least one ball slot is made perpendicularly to said channel.

Description of Figures

[0014]

Figure 1 is a cross-sectional view of the speed and direction control apparatus under an exemplary embodiment of the present invention.

Figure 2 is a view of the supporting body as one of

the parts of the present invention.

Figure 3 is a cross-sectional view of the ball and elastic element unit ensuring the button and button contact block's step effect.

Figure 4 is a view of a triangular ball slot in the ball and elastic element unit ensuring the button and button contact block's step effect.

Reference Numbers

[0015]

1. Supporting Body
2. Position Fixation Channel
3. Button
4. Button Contact Block
5. Position Fixation Detent
6. First Step Speed Surface
7. Second Step Speed Surface
8. Button Assembly Slot
9. Elastic Element
10. Ball
11. Ball Slot
- 11.1. Obstruction

Detailed Description of Invention

[0016] Figure 1 illustrates a control box apparatus of a carrier system according to the present invention. In said embodiment, a supporting body (1) is embodied having in its interior a bearing to support said apparatus. At least two cylindrical button assembly slots (8) are made on the cover section of the supporting body (1). Eight position fixation channels (2) are embodied making forty-five (45)-degree angles to the inner wall of said slots (8).

[0017] Buttons (3) are positioned on said button assembly slots (8), such buttons being embodied in a cylindrical form and mountable thereto in optionally varying angles. Two position fixation detents (5) are positioned on the lateral walls of said button (3). Said position fixation detent (5) is positioned on said position fixation channels (2) so that it can be assembled in line with the direction the carrier element is to be driven. By rotating the button (3) around its axis in line with the direction said carrier system is to be driven, it is positioned on the button (3) position fixation channels (2) by means of the position fixation detents (5) on itself.

[0018] A step is provided by making a cylindrical orifice with a relatively smaller diameter on the depressing surface of said button (3). A circular obstruction is formed into the interior and along the inner circumference of said orifice. Said obstruction is called the second step speed surface (7). In said step, the external walls of the button's (3) inferior correspond to the first step speed surface (6). One apiece trigger is embodied on the button contact

blocks (4) positioned underneath said button (3). Thanks to this circular obstruction and the fact that the button contact block (4) triggers are made in a single-type, a facility is provided with respect to mold diversity.

5 [0019] When said button (3) is depressed, the first step speed surface (6) depresses the trigger of the first step speed contact block (4) such that the system is provided with the first step speed. Meanwhile, the trigger of the second step speed block (4) enters into the button (3) without contacting any points, due to the step formed on the button (3).

10 [0020] While the edges of contact blocks are made different in other solutions, a step is embodied in the current solution by means of the circular dent on the button depressing surface. Accordingly, even if the button (3) arrows are used in different angles, the double speed function is maintained thanks to this feature. At the same time, another stop button contact block (3) can optionally be made by making use of the first step surface (6) of the button (3) with the purpose of providing the system with electricity safety function.

15 [0021] When the button (3) is depressed again, the second step speed surface (7) depresses the trigger of the second step speed block (4) such that the system is provided with the second step speed.

20 [0022] In said embodiment, a channel is formed on the button (3) hub in a parallel manner to the button contact block (4) in order to allow an operator to sense the switches between such speed steps. A ball (10) is positioned in said channel. A ball slot (11) is embodied on the button (3) hub in a perpendicular manner to the channel where the ball (10) is positioned. An elastic element (9) is positioned in said channel. Said ball (10) moves downwards together with the button hub, as a result of the push-force applied to the button (3).

25 [0023] When the first speed step is terminated, said ball (10) becomes released from the push-force applied by the button (3) and enters into the ball slot (11). While it is released from said push-force, a pausing circumstance occurs in the system. With this pausing circumstance, the operator becomes aware of that the second speed step is to be switched to. In order to allow an operator to sense said pausing circumstance easily, the button hub must encounter a relatively stronger obstructive force while moving downwardly, and a minimal obstructive force while moving upwardly during operation.

30 [0024] With the purpose of creating an obstructive force in the movement of said button hub, the ball slot (11), where said ball (10) enters after becoming released from the button's (3) push-force whilst the first speed step is terminated, is embodied in a triangular manner. The basal edge of the triangle provides an obstruction (11.1) to the ball (10), while the button hub moves downwards. When the button hub moves upwards, the ball (10) contacts the triangular ball slot's (11) corner that accommodates the apex angle, and continues its upwards movement.

Claims

1. A speed and direction control apparatus controlling the changes in direction and speed to be traversed by carrier systems, said apparatus comprising a button assembly slot (8) embodied on a supporting body (1); a button (3) positioned in said button assembly slot (8); a button contact block (4) positioned on said supporting body (1) and under said button (3); and a ball (10) positioned in the hub of said button (3); said apparatus being **characterized in** further comprising
 - an obstruction (7) positioned on an orifice that is opened on said button (3), and that is formed along the inner circumferential surface of a circular formation having essentially a smaller diameter as compared to the diameter of said button (2).
2. A speed and direction control apparatus according to Claim 1, **characterized in** comprising at least one contact detent (5) embodied on said button (3).
3. A speed and direction control apparatus according to Claim 1, **characterized in that** said obstruction is second-step speed surface (7).
4. A speed and direction control apparatus according to Claim 1, **characterized in** comprising at least one position fixation channel (2) positioned on the inner wall of said button assembly slot (8).
5. A speed and direction control apparatus according to Claim 1, **characterized in** comprising at least one elastic element (9) positioned in the channel embodied on the hub of said button (3).
6. A speed and direction control apparatus according to Claim 5, **characterized in** comprising at least one ball slot (11) embodied in a perpendicular manner with respect to said channel.
7. A speed and direction control apparatus according to Claim 1, **characterized in** comprising at least two button assembly slots (8) embodied on said supporting body (1).
8. A speed and direction control apparatus according to Claim 1, **characterized in** comprising a ball slot (11) on said button (3) to create an obstructive force towards the button hub's movement; said ball (10) entering into said ball slot (11) after becoming released from the button's (3) push-force whilst the first speed step is terminated; and said ball slot (11) having a basal edge that is embodied so as to provide an obstruction (11.1) against the ball, in the downward movement of the hub of said button (3).
9. A speed and direction control apparatus according to Claim 8, **characterized in that** said ball slot comprises a triangular ball slot embodied in a triangular geometric form.

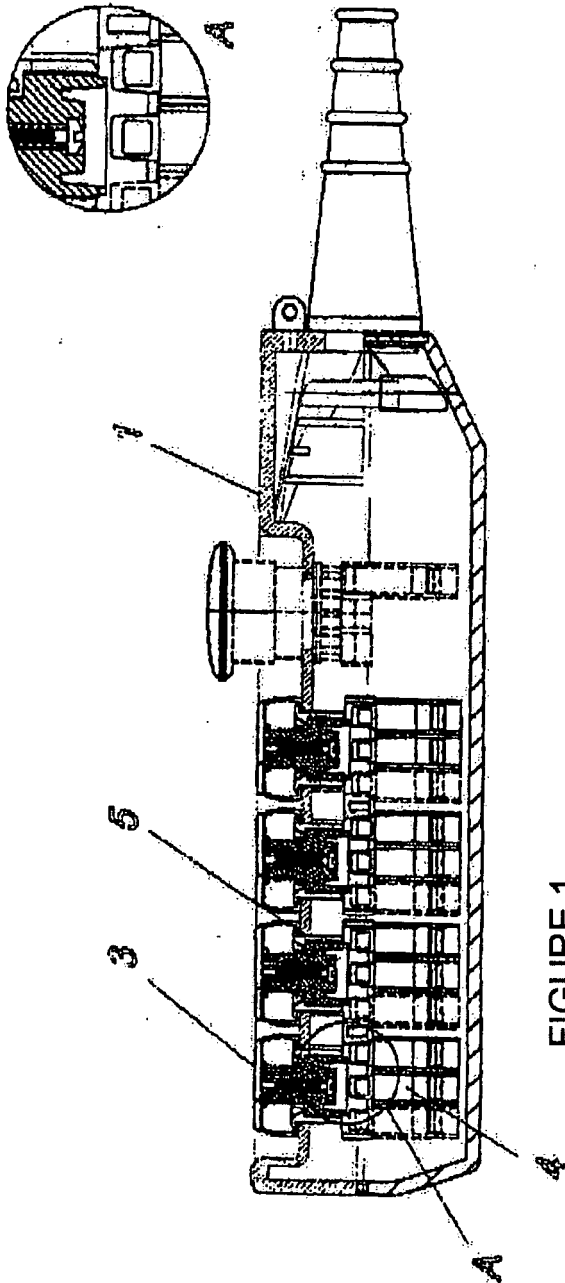


FIGURE 1

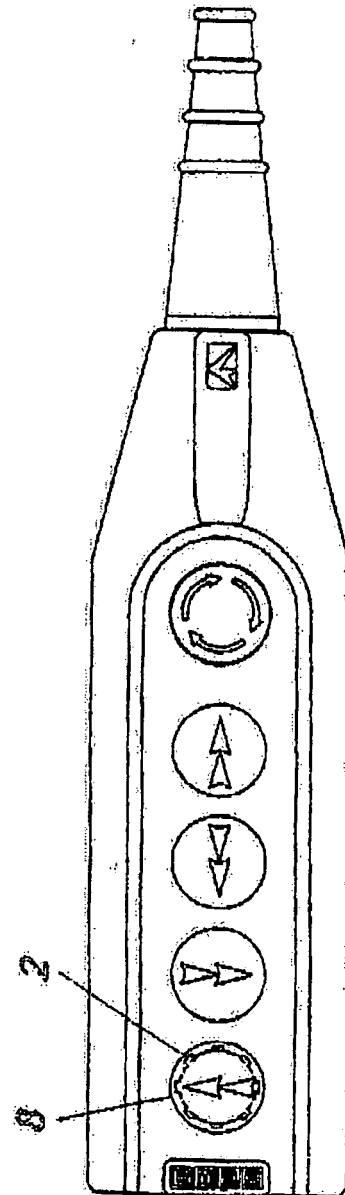


FIGURE 2

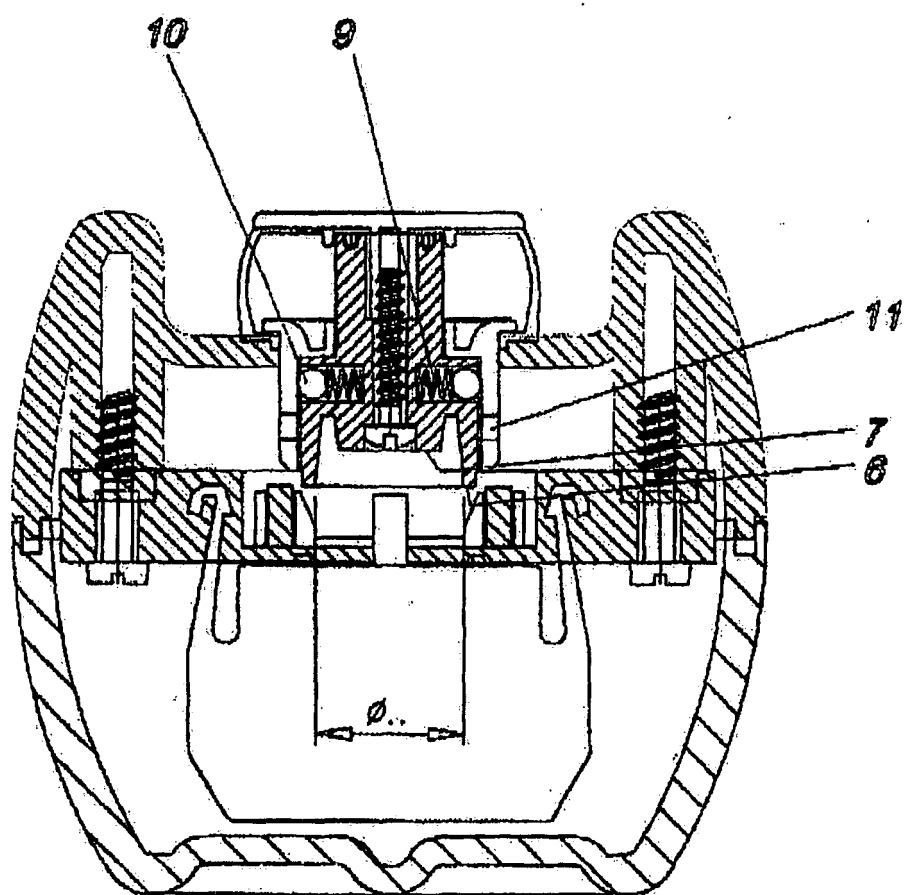


FIGURE 3

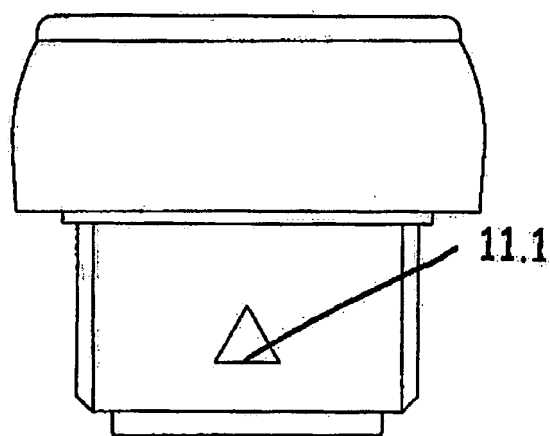


FIGURE 4



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 6389

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 469 164 A (JOHN P. TRUEMPER ET AL) 23 September 1969 (1969-09-23) * the whole document *	1-9	H01H9/02 H01H13/00
A	EP 0 257 647 A (KABUSHIKI KAISHA KITO) 2 March 1988 (1988-03-02) * abstract *	1-9	
A	FR 2 509 520 A (MANNESMANN AG) 14 January 1983 (1983-01-14) * the whole document *	1-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			H01H A63H G06F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 31 January 2006	Examiner Blumenberg, C
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	

1
EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 01 6389

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

31-01-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3469164 A	23-09-1969	DE 1456457 A1	19-06-1969
		FR 1500603 A	03-11-1967
		GB 1149258 A	23-04-1969

EP 0257647 A	02-03-1988	DE 3788023 D1	09-12-1993
		DE 3788023 T2	14-04-1994
		ES 2044884 T3	16-01-1994
		FI 873724 A	01-03-1988
		KR 9103034 B1	17-05-1991
		US 4789135 A	06-12-1988

FR 2509520 A	14-01-1983	DE 3126699 A1	27-01-1983
