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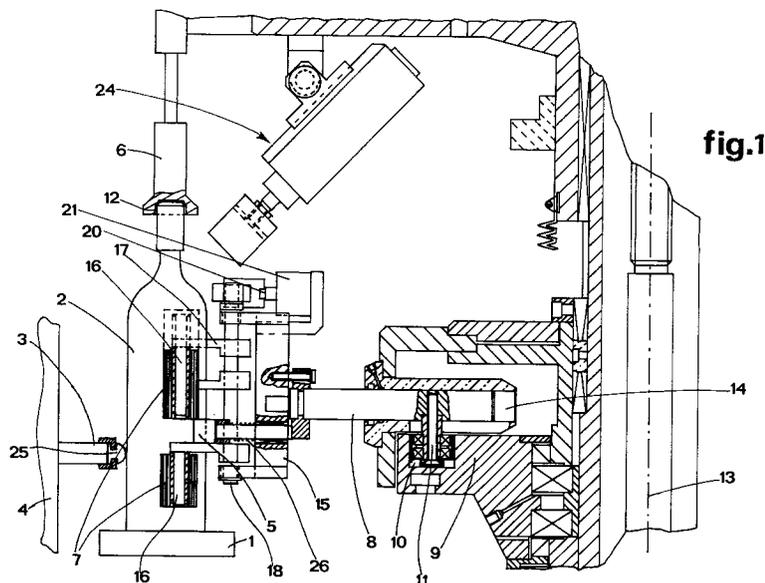
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A device in labelling machinery for aligning glass containers and pressing labels onto containers thus aligned.

Designed for integration into a conventional glass bottle labeller, the device serves to position a speciality type bottle (2) (square, rectangular, triangular or oval in section) in readiness for application of a label, then to press and smooth the label onto the correctly aligned bottle; the initial alignment is brought about by means of a fixed guide rail (3) operating in conjunction with a movable locator (5)

mounted to a plate (15) and reciprocated by a cam-driven plunger (8), whereupon the label is flattened thoroughly over the glass by an assembly of pivoting rollers (7) carried by the same mounting plate (15). Simple and effective in design and operation, the device leads ultimately to a more compact machine and to better quality labelling.



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The present invention relates to a device designed for use in labelling machinery, by means of which to align glass containers and press labels onto the containers thus aligned.

Labelling machines generally comprise a revolving circular platform and a plurality of pedestals, uniformly distributed around the periphery of the platform, on which to stand the containers for labelling.

The containers are directed onto the pedestals by star wheel conveyor devices of conventional type. In the course of its rotation, the platform passes through one or more labelling stations at which a label drawn from a magazine is invested with gum and transferred to the relative container.

Many types of container must first be appropriately aligned so as to ensure that a label is positioned correctly in relation to other labels or seals applied previously, or so as to offer the selected face of a container of particular shape.

For example, in the case of speciality bottles with a cross section of square, rectangular, triangular, elliptical or other non-cylindrical profile, widely adopted for liqueurs, the need clearly exists for the bottle to be correctly aligned before labels can be affixed.

Hitherto, such preliminary alignment operations have been effected using pedestals embodied with a profile matched to the bottom of the bottle for labelling, and equipped with a central ejector by which the bottle is removed on completion of the labelling operation.

The main drawback encountered with such systems of alignment stems from the dimensional tolerances adopted in manufacture of the bottles. In effect, the base dimensions exhibited by two bottles of the same design may differ even by as much as a few millimetres, and thus disallow correct alignment, whereas faultless label alignment is indispensable in the case of bottles for costly and image-gearred products such as liqueurs.

In the case of bottles with a squared cross section for example, geometrical inaccuracies attributable to manufacturing tolerances are the cause of many labelling rejects.

In addition, a square section bottle betrays the further drawback that difficulty is encountered in applying labels that extend beyond the width of one face, and more exactly in wrapping the label around the corners of the bottle.

Conventionally, the labels are pressed and smoothed onto the bottles by systems comprising brushes or mechanical grippers, though the brushes must remain associated with the bottle for a relatively long interval of time to ensure thorough adhesion of the label, in consequence of which the labeller tends to exhibit considerable dimensions and bulk. Accordingly, the object of the present

invention is to provide a device for the alignment of containers exhibiting special, non-cylindrical shape, such as will enable one or more labels to be positioned faultlessly on each container notwithstanding the dimensional tolerances adopted in manufacture of the containers.

A further object of the invention is to render the device simple and functional in the extreme, and able to press and smooth labels onto and over the containers in such a manner as will result in the embodiment of labelling machinery more compact than hitherto.

The stated objects are fully realized in a device according to the present invention for aligning glass containers and pressing labels onto the containers thus aligned, in a labelling machine for speciality glass containers typically of square, rectangular, triangular or oval cross sectional profile to which one or more labels are affixed during their passage through the machine on the bottle pedestals of a revolving platform, which is characterized in that it comprises alignment means consisting in the combination of:

- a fixed guide rail rigidly associated with the fixed frame of the labelling machine;
- a plurality of movable locators associated one with each pedestal of the revolving platform, each shaped to accommodate the contours of the container in production and designed to interfere with the corresponding external surfaces in such way that the container, compassed laterally between the locator and the guide rail and vertically between the pedestal beneath and a retaining head above, is caused to position itself in correct alignment for a subsequent labelling operation by accomplishing enforced limited angular movements about its own centre axis.

The device further comprises means of movable embodiment associated with the alignment means and serving to press and smooth the labels against the external faces of the container, which consist in a plurality of rollers designed to flatten each label edge to edge against the container, following the contour of the external faces.

The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- fig 1 is an elevation showing the device partly in section through a diametral plane;
- fig 2 shows the device from a radial standpoint;
- fig 3 shows the device in plan;
- fig 4 is a graph illustrating the movements of the single components of the device and the labelling machine.

With reference to figs 1, 2 and 3 of the drawings, 1 denotes one of a plurality of pedestals

uniformly distributed around the periphery of a revolving circular platform (not illustrated) rotatable about a central axis 13.

In the course of its rotation, the platform passes through one or more conventional labelling stations (not illustrated).

Each pedestal 1 is designed to support a container or bottle 2 throughout its period of transit on the platform, which takes in an initial alignment step and a subsequent labelling step.

Whilst reference is made in the specification to a bottle of square cross-sectional profile, it will be clear that the invention might apply equally to any glass container of non-cylindrical shape. 9 denotes a fixed cam, embodied as a disc rigidly associated with the fixed frame 4 of the labelling machine and affording a profile groove denoted 10. 11 denotes one of a plurality of pins 11 equal in number to the pedestals, or to the bottles carried by the platform, which are accommodated by the groove 10 and engage in corresponding plungers 8. Each plunger 8 is radially slidable, with respect to the central axis 13, internally of a cylindrical cavity 14 moving as one with the platform. Thus, as the platform rotates, the plungers 8 are caused to stroke in the radial direction as the respective pins 11 follow the profile of the groove 10. The single plunger 8 is fastened to a corresponding plate 15 serving to support a moving locator 5, performing the function of alignment means, which is shaped to match the contours of the bottle 2 in production and designed to interfere with the relative external faces so as to bring about a correct alignment of the bottle in readiness for subsequent labelling; compassed by the locator 5 on the one hand, and by a fixed guide rail 3 rigidly associated with the frame 4 of the machine on the other, the bottle 2 is made to accomplish limited angular movements about its own axis, and thus to settle ultimately into the correct position. The fixed guide rail 3 is faced with a moulding 25, preferably of antifriction plastics material, which can be replaced when worn.

During the initial positioning and alignment step, the bottle 2 is held between the pedestal 1 upon which it stands, and a retaining head 6 above, the latter affording a socket 12 in which the top-most extremity of the bottle neck is insertable in such a way that the bottle is left free to rotate about its own axis while remaining coaxially aligned with the socket.

The locator 5 is spring-loaded radially in order to accommodate any irregularity of shape in the single bottle, by the action of two springs 26 positioned between the locator and the plate 15, of which one only is shown in the drawings.

The plungers 8, together with the fixed cam 9, the groove 10 and the pins 11, constitute means by which to invest the locators 5 with movement. Each

plate 15 also carries movable means by which to press and smooth a label against the external faces of the bottle; these consist in a plurality of rollers 7, four in the example illustrated, by which the labels are flattened against the bottle and smoothed over their entire area, edge to edge, following the contours of the bottle.

The rollers 7, fashioned in high density rubber, are freely rotatable about respective pivots 16 supported by arms 17 keyed to vertical shafts 18, the latter rotated by further arms 19 connected to the rod 20 of a pneumatic cylinder 21.

More exactly, the rod 20 carries a pin 22 inserted in a slot 23 afforded by the end of each arm 19, and when reciprocated in the radial direction thus causes the shafts 18 to rotate, spreading apart or contracting the pairs of rollers.

In an alternative embodiment not illustrated in the drawings, each roller is independently sprung by the incorporation of at least one flexible reaction element, to the end of ensuring faultless adherence to the contour of the bottle.

Thus, the rollers 7 can assume an open or a closed configuration, according to whether the rod 20 is extended or retracted, and can be positioned at any given height on the shafts 18 according to the type of bottle and the type of label.

In the embodiment of the device illustrated by way of example, the four rollers are arranged in two pairs: a top pair serving to press and smooth a label affixed skew to one face of the bottle, and a bottom pair serving to press and smooth a label disposed horizontally.

24 denotes a device of conventional embodiment by which pressure is applied to labels affixed to the neck area of the bottle.

The pedestal 1 is rotatable about its own axis, driven by conventional means not illustrated in the drawings, whilst the retaining head 6 is capable of movement in the vertical direction, brought about likewise by means not illustrated.

Fig 4 affords a graphic representation of the steps accomplished by certain parts of the alignment and pressing device and of the labeller, illustrating the case of a substantially square section bottle with labels applied to two opposite and parallel external faces.

Trace 'a' in fig 4 represents the vertical movement of the head 6, trace 'b' the radial movement of the plunger 8, trace 'c' the opening and closing action of the rollers 7 (spreading and contracting), and trace 'd' the rotation of the pedestal 1.

In operation of the device, the bottle 2 is taken up between the alignment means, i.e. the locator 5 and the guide rail 3, prior to its arrival at one of the labelling stations, and manoeuvred into a position on the pedestal whereby the two opposite parallel faces to be labelled are disposed normal to the

radius of the platform coinciding with the centre of the bottle.

The 'x' axis in fig 4 shows a numbered succession (not to scale) of the steps effected by the device according to the present invention and by certain components of the labelling machine.

The steps in question reflect different angular positions of the platform, with the full cycle of steps denoted [0, 1, ... 11, 0] corresponding to one full 360° revolution of the platform.

In fig 4, the steps correspond thus:

- 1 - descent of the head 6 onto the bottle;
- 2 - partial reascent of the head, thereby removing pressure from the bottle while retaining the neck internally of the socket 12, and allowing rotation of the bottle about its own axis;
- 3 - extension of plunger 8 and locator 5;
- 4 - redescent of head to secure the bottle;
- 5 - application of label (front); retraction of plunger and locator;
- 6 - initial movement in rotation of pedestal and bottle through 180°;
- 7 - completion of rotation through 180°;
- 8 - extension of plunger and contracting movement of rollers 7;
- 9 - application of label (rear);
- 10 - retraction of plunger and locator, and spread of rollers;
- 11 - ascent of head 6;
- 12 - initial movement in rotation of pedestal through 180°;
- 13 - completion of rotation through 180° and return to start-of-cycle configuration.

Claims

1. A device for aligning glass containers and pressing labels onto containers thus aligned, in a labelling machine for speciality containers (2) typically of square, rectangular, triangular or oval cross sectional profile to which one or more labels are affixed during their passage through the machine on the pedestals (1) of a revolving platform, characterized in that it comprises alignment means consisting in the combination of:
 - a fixed guide rail (3) rigidly associated with the fixed frame (4) of the labelling machine;
 - a plurality of movable locators (5) associated one with each pedestal of the revolving platform, each shaped to accommodate the contours of the container in production and designed to interfere with the corresponding external surfaces in such way that the container (2), com-

passed laterally between the locator (5) and the guide rail (3) and vertically between the pedestal (1) beneath and a retaining head (6) above, is caused to position itself in correct alignment for the subsequent labelling step by accomplishing enforced limited angular movements about its own centre axis.

2. A device for aligning glass containers and pressing labels onto containers thus aligned, in a labelling machine for speciality containers (2) typically of square, rectangular, triangular or oval cross sectional profile to which one or more labels are affixed during their passage through the machine on the pedestals (1) of a revolving platform, characterized in that it comprises means of movable embodiment associated with each container that passes through the machine and serving to press and smooth the labels against the external faces of the container, consisting in a plurality of rollers (7) designed to flatten a label edge to edge over the container, following the contour of the external faces.
3. A device as in claim 1, wherein the locator (5) is invested with movement by means comprising:
 - a plunger (8) reciprocated radially in relation to the platform;
 - a fixed cam (9) affording a profile groove by which a continuous looped trajectory is described around the central axis (13) of the platform;
 - a pin (11) slidably accommodated by the groove (10) and rigidly associated with the plunger (8).
4. A device as in claim 1, further comprising at least one spring (26) positioned between the locator (5) and a relative mounting plate (15), serving to accommodate any departure of the single containers from a standard production shape.
5. A device as in claim 1, wherein the retaining head (6) affords an internal socket (12) that permits of holding the container (2) positioned coaxially on the pedestal (1) while able to rotate about its own axis into the correct alignment for labelling.
6. A device as in claim 2, wherein the rollers (7) are fashioned in high density rubber.
7. A device as in claims 2 and 3, wherein the

rollers (7), arranged in pairs and mounted to respective arms (19), are reciprocated radially as one with the locator (5) and by the same means (8, 9), and caused to spread apart and contract tangentially by a pneumatic cylinder of which the rod is connected to the arms. 5

8. A device as in claim 2, further comprising flexible reaction elements associated with each roller (7) by which the roller is rendered independently and elastically adaptable to the shape of a container. 10

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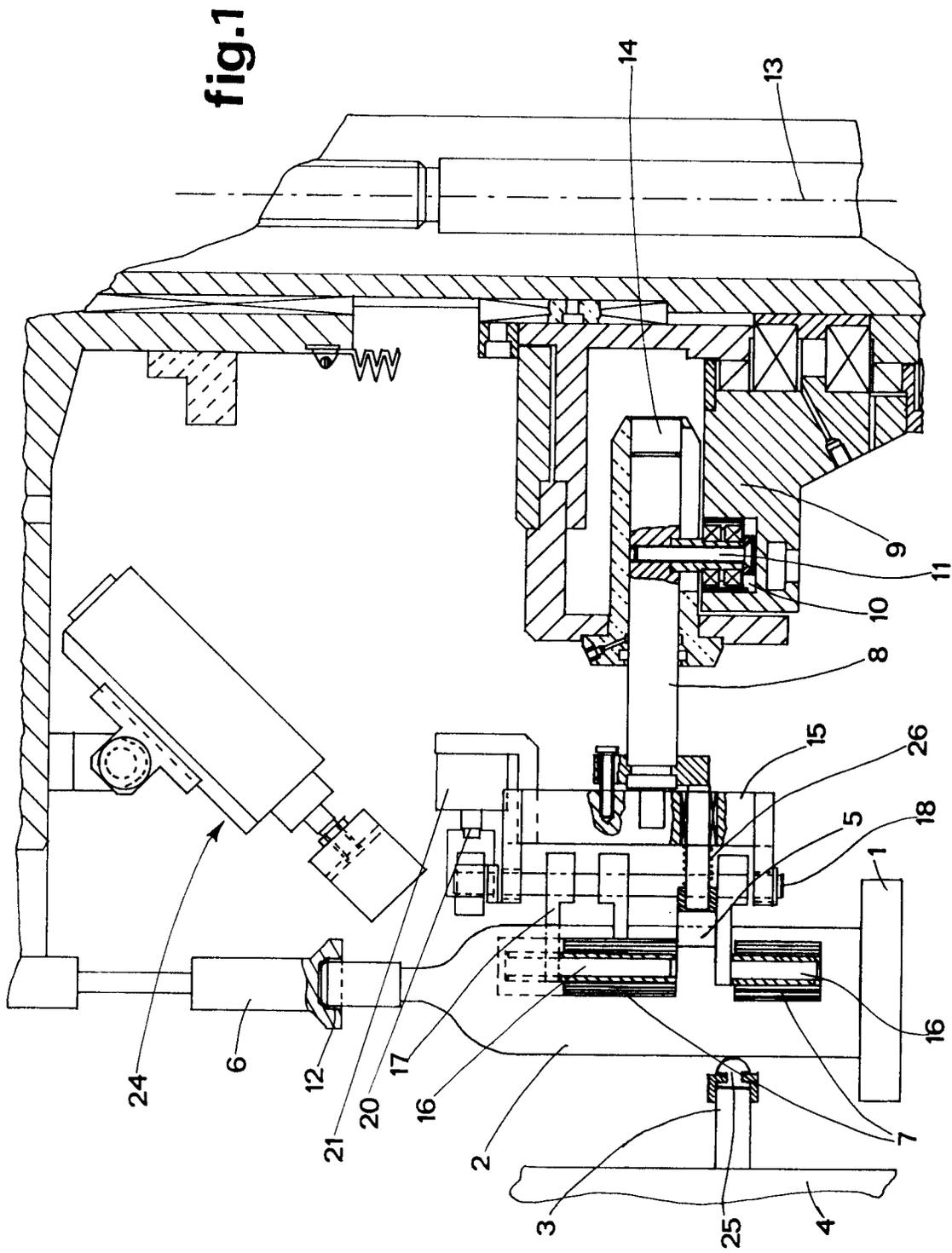
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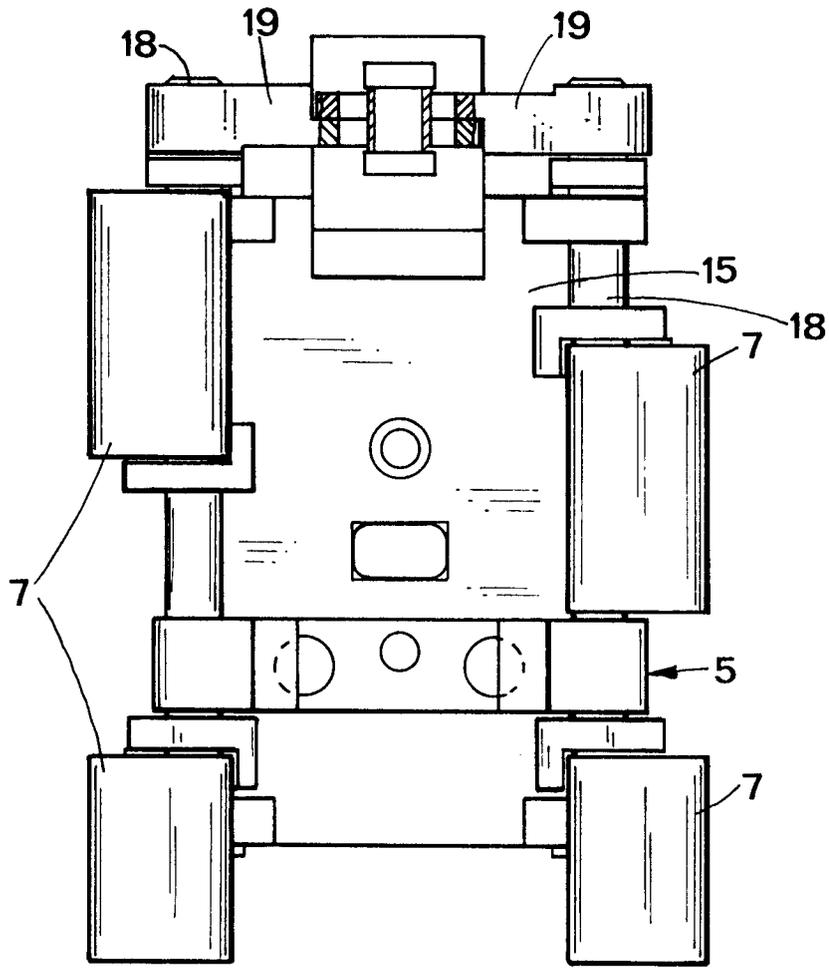


fig.2

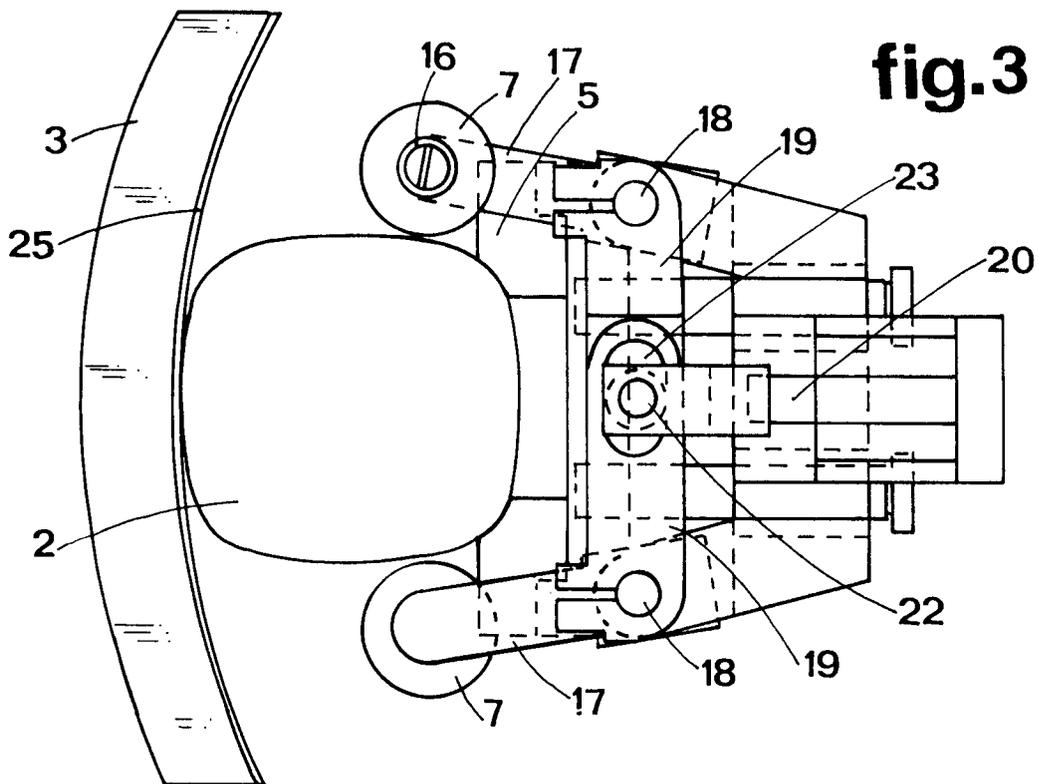


fig.3

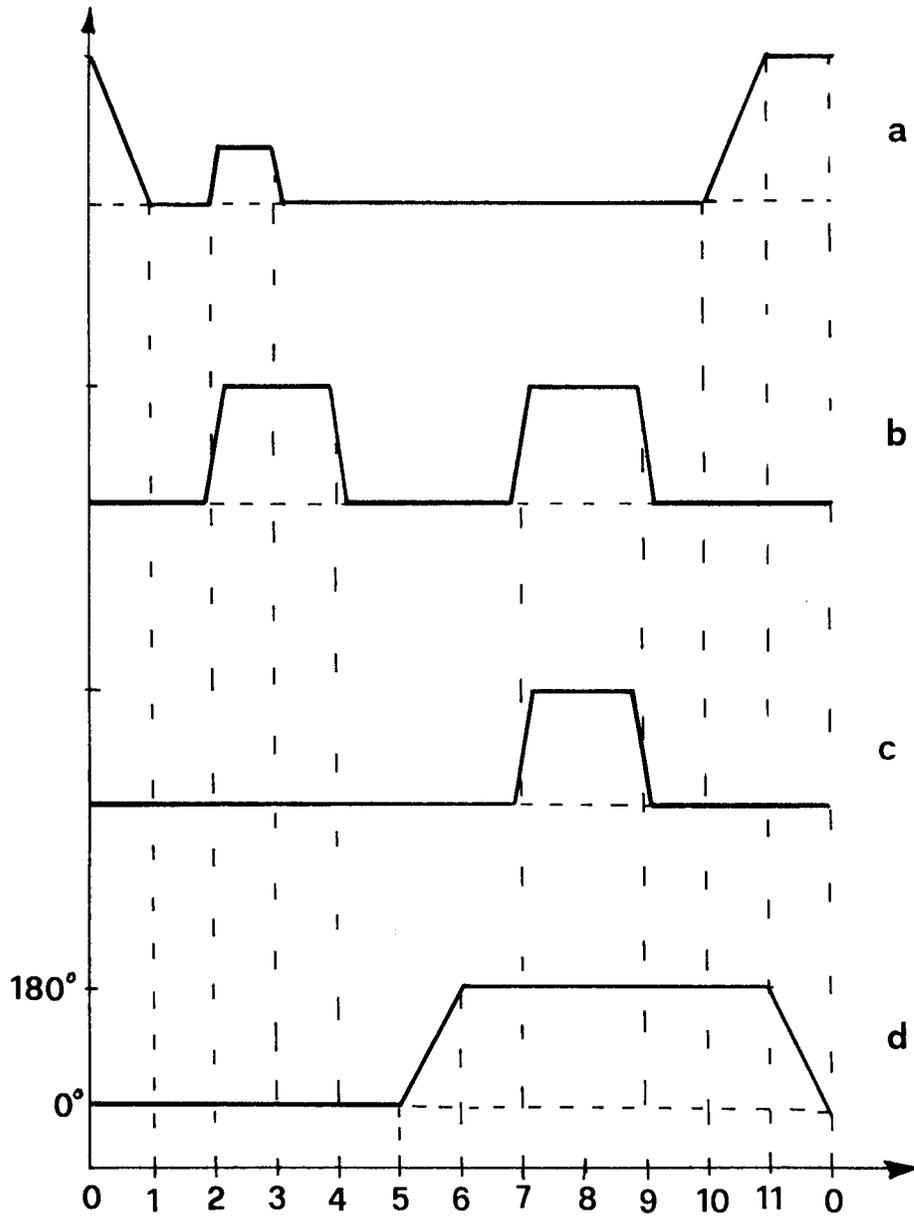


fig.4