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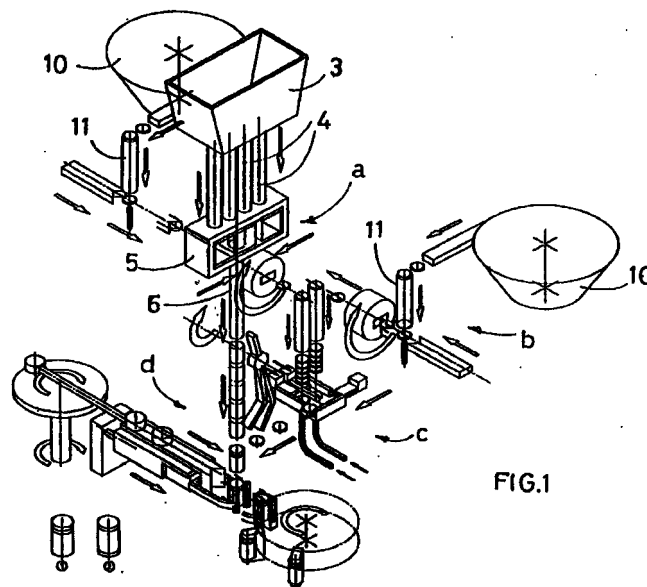
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(54) **Assembling apparatus for cork stoppers**

(57) Apparatus for the assembling of cork stoppers from a granulated cork body and at least one cork disk, comprising a supplying section (a) of granulated cork bodies (1) and a supply section (b) of cork disks (2), comprising a gluing and assembling centre (c) provided with means (15-18) for distributing glue on one or more disks (2) coming from said section (b) and means (19, 20, 30-33, 38) to assemble one body (1) coming from said section (a) together with at least one disk (2), wherein said centre (c) is provided with a positioning device (20) of the body (1) in respect to disks (2) previously provided of glue.



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Description

Field of the invention

[0001] The present invention relates to the cork stoppers manufacturing field and in particular it refers to an apparatus intended to assemble cork stoppers which are formed by a body of granulated cork material to which at least one disk of cork is glued.

Prior art

[0002] At moment, already existing apparatus are known which are provided with a free fall supply line of the granulated cork bodies and with one or more supply lines of cork disks which are to be glued to an extremity of the body by at least one gluing centre.

[0003] The position of the disk to be glued (it is known that the position of the disk has to be selected is such a way that, once it has been glued to the granulated cork body, its good side is in sight and the value of the cork stopper is increased) is determined by a vibrating hopper. The hopper is provided with a predetermined path along which the disks can slide. At an intermediate position of that path there is placed a reader which is able to detect a mark printed on the selected side of the disk, and a rejecter which rejects the disks which are positioned in the wrong direction and puts them again into the hopper.

[0004] From the hopper, the selected disks pass to a gluing centre and are glued to the granulated cork bodies which are continuously supplied by a chain conveyor.

[0005] In the case of two disks on the same side of a single cork stopper (for example in the case of cork stoppers for bottles of "Spumante" wine) two identical gluing centres are placed one after the other, and the second one places the respective disk on the upper side of the preceding disk.

[0006] At this point, the formed cork stoppers can be grabbed and pressed by the pliers of the conveyer during their passage in a drying kiln. After that passage the stoppers are collected and delivered for further treatments.

[0007] These already known apparatus have several drawbacks due to their low efficiency and poor flexibility for the assembling of stoppers having a different structure, for example the so called "one plus one" cork stoppers which are formed by a granulated cork body having one cork disk at each end.

[0008] In particular, the selection of the cork disk which are properly positioned is performed by a rejecting mechanism which penalises the productivity of the selection phase.

[0009] In addition., the manner by which the gluing centres are arranged and the length of the path which the assembled stoppers have to go along before their entry into the kiln oblige the operator to frequently clean

up wide portions of the apparatus.

[0010] A further disadvantage is given by the inflexibility of those apparatus, which need substantial modifications in order to be adapted to the assembling of cork stoppers having different compositions, such modifications being not always able to guarantee the necessary reliability.

Aim of the invention

[0011] A first aim of the invention is to overcome the drawbacks of the already known apparatus.

[0012] A further aim of the invention is to provide an apparatus having high flexibility and high productivity in the assembling of cork stoppers.

Summary of the invention

[0013] These aim have been reached according to the invention by an apparatus intended to the assembling of cork stoppers made of a granulated cork body and one or more cork disks. The apparatus comprises only one gluing and assembling centre of the cork stopper disks, the centre comprising a device by which the granulated cork body is positioned in respect of the disks.

[0014] The apparatus further comprises an upside down turner of these disks which are initially positioned in the wrong direction and which have to be turned before gluing.

[0015] Advantageously, the reading of the marked side of the disk is made in a static manner, when the disk is stopped, so that the reading errors of the conventional apparatus are avoided.

[0016] According to the invention, the entrance of the assembled stoppers in the kiln (of conventional type) is immediately upstream the gluing and assembling centre.

[0017] In a preferred embodiment, the positioning of the granulated cork bodies in respect of the discs is obtained by a lifting hook placed under the free fall supply line of the same bodies.

[0018] Preferably, the conveying operations of the disks to the gluing and assembling centres and to the turner, and the conveying of the assembled stoppers to the pliers are performed by oleo-dynamic linear actuators.

[0019] The advantages of the invention consist essentially in that the apparatus has an higher flexibility and smaller overall dimensions then the already known apparatus and that it needs lower maintenance care and less frequent cleaning operations.

List of drawings

[0020] These and further advantages will be better comprised by a man skilled in the art from the following description and from the annexed drawings, given as a

non limiting example, in which:

- fig.1 shows a schematic view of the apparatus as a whole;
- fig.2 shows a more detailed scheme of the bodies supplying section "a" of the apparatus of fig.1;
- fig.3 shows a more detailed scheme of the disks supplying line and disks turning section "b" of the apparatus of fig.1;
- fig.4 shows a more detailed scheme of the gluing and assembling section "c" of the apparatus of fig.1;
- fig.5 shows a more detailed scheme of the cork stoppers exit section "d" of the apparatus of fig.1;

Detailed description

[0021] According to the invention and with reference to the annexed drawings, an assembling apparatus for cork stoppers having a granulated cork body consists of:

- a supply section "a" of granulated cork bodies 1;
- a centre "b" supplying cork disks 2 and possibly able to upside down turn the disks which have to be properly positioned and then glued to the bodies 1;
- a gluing and assembling centre "c" of the bodies 1 together with the disks 2;
- an exit section "d" of the already assembled cork stoppers.

[0022] With reference to figures 1 and 2, the supplying section "a" of granulated cork bodies 1 is described.

[0023] The section is constituted by an hopper 3 from which bodies 1 fall along a plurality of channels 4 down to a room 5 where are provided selection means of in se known type and therefore not described in details. The selection means send to a second channel 6 an ordered series of the bodies coming form channels 4. Bodies 1 fall along channel 6, down to its lower extremity of where an hook 20 stops them.

[0024] With reference to figures 1 and 3, the supply station of the disks 2 is described.

[0025] Section "b" consists of two vibration hopper 10, of in se known type, from which disks 2 can reach two vertical channels 11. At the bottom of channels 11 there are placed two reading optical sensors 12 able to detect a mark printed on a selected side of each disk and to possibly activate, if necessary, the upside down turners.

[0026] Each of those turners consists of an horizontally movable plate 13 which is positioned on the reading plane of a disk which has to be turned upside down.

[0027] The front extremity of plate 13 is "V" shaped and it is able to collect a disk 2 and to push it inside a sleeve 14 rotating around an horizontal axis.

[0028] On functioning, sensor 12 first activates the displacement of plate 13 towards sleeve 14 and then, if

a turning of the disk is needed, it activates a 180° turning of the same sleeve together with plate 13 and disk 2, so that disk 2 is positioned in the desired manner in respect to the granulated cork body 1.

[0029] Once the turning is completed, the displacement of plate 13 continues and disk 2 is brought to the gluing/assembling centre of the cork stoppers.

[0030] With reference now to figure 1 and 4, the cork stoppers gluing and assembling centre "c" of the invention is described.

[0031] The disks coming from channels 11, properly positioned, take place on two seats 16 adjacent each other and vertically spaced of a distance at least equal to the thickness of a disk. Two skates 15 can slide along the seats 16 in order to push the disks 16 against an abutting rim 17 along which they are aligned. Under seats 16, in correspondence of the centres of disks 2 abutting rim 17, the exit nozzles of two glue dispensers 18 are provided, which distribute a layer of glue on the lower sides of disks 2.

[0032] Anyway, it is evident that the dispensers can be placed in different positions, in order to distribute glue on the upper side of one or more disks.

[0033] Once the glue has been dispensed, a further skate 19, sliding in a transversal direction in respect to skates 15, brings the glued disks, superimposed one on the other, to a position correspondent to the position of the granulated cork bodies 1, so that a cork stopper can be assembled according to the invention.

[0034] An hook 20 able to be displaced vertically and to rotate around an horizontal axis is provided under channel 6 and is aligned thereto. There, aligned with channel 6, there is an horizontal displacing device 30 which is intended to move the cork stoppers to be assembled.

[0035] Preferably, in the described embodiment the displacing device is driven by a rod 37 which is in turn operated by a cam mechanism 36.

[0036] On functioning, hook 20 is initially in a lowered position and detached from the vertical column of bodies 1. After that the first body 1 is positioned on the displacing device 30, hook 20 rotates form the detached position to an advanced position so that it hooks the second body of the column and lifts it together with the remaining bodies. In this way a free space above the first body is made available. After that, a first plate 38 of displacing device 30 goes forward pushing the first body against a couple of reference pins 31, which pins determine the exact position where skate 19 can bring on first body 1 the disks 2 already provided with a layer of glue on the lower sides.

[0037] In order to bring the assembled cork stoppers to the exit of the apparatus, displacing device 30 prosecutes in its motion by operating a second plate 32 which is made integral to pins 31 by two lateral arms 33.

[0038] In that way, the assembled cork stopper is kept between a V shaped front end of plate 38 and the reference pins 31.

[0039] When displacing device 30 stops the cork stoppers composed by a body 1 and the two disks 2, the stoppers are inserted between suitable pliers 34 which pass in front of the displacing device 30 and bring the stoppers to a kiln to be cooked according to a in se 5 known method.

[0040] The above illustrated assembly (one body having two disks at the same extremity) is useful for the manufacturing of cork stoppers for "Spumante" wine. Anyway, the apparatus of the invention can be advanta- 10 geously utilised for the manufacturing of different stoppers and in particular for the manufacturing of "one plus one" cork stoppers, obtained by gluing one cork disk to each extremity of a granulated cork body.

[0041] In more detail, in the latter case the stopper is assembled as follows: 15

- The lower extremity of the first body has already been provided with a glued disk. Hook 20 allow bodies 1 to fall down and lifts, as already described, the second of the vertical column of bodies; 20
- the disk 2 which is placed in the lower seat 16 of centre "c" is provided glue with glue on the lower side, while the other disk is provided with glue on the upper side. Skate 19 places the two superim- 25 posed disks on the body 1 resting on mover 30;
- hook 20 allows the bodies 1 to fall down and lifts again the second body together with the upper disk, adhering to the lower extremity o the second body, while the other disk will adhere to the upper side of the first body; 30
- displacing device 30 brings the first body to pliers 34;
- hook 20 allows the column of bodies to fall down. 35

[0042] Again, the first body of the column has a disk attached to the lower extremity and the initial condition is restored.

[0043] Thanks to the compactness of the components and to the minimal displacements involved in its functioning, the apparatus of the invention is advanta- 40 geously able to assemble different type of cork stoppers by minimal modification and keeping safe its high productivity.

[0044] The present invention has been described with reference to a preferred embodiment, but it is obvious that equivalent modifications can be made by a man skilled in the art, without outgoing from the scope of the invention. 45

Claims

1. Apparatus for the assembling of cork stoppers from a granulated cork body and at least one cork disk, comprising a supplying section (a) of granulated cork bodies (1) and a supply section (b) of cork disks (2), characterised in that it comprises a gluing and assembling centre (c) provided with means 50

(15-18) for distributing glue on one or more disks (2) coming from said section (b) and means (19, 20, 30-33, 38) to assemble one body (1) coming from said section (a) together with at least one disk (2), wherein said centre (c) is provided with a positioning device (20) of the body (1) in respect to disks (2) previously provided of glue.

2. Apparatus according to claim 1, characterised in that said supply sections (a, b) are free fall supply section provided with fall channels (6, 11) of the bodies (1) and of the disks (2).
3. Apparatus according to claim 1, characterised in that said section (b) comprises at least one upside down turning device (12-14) able to turn said disks (2) arriving at the gluing centre.
4. Apparatus according to claim 2, characterised in that said section (a) consists of an hopper (3) from which bodies (1) fall along channels (4) down to a room (5) where selection means able to deliver to said channel (6) series of bodies coming from channels (4) are present.
5. Apparatus according to claim 2, characterised in that said section (b) consists of at least one vibrating hopper (10) from which the disks can reach said vertical channels (11).
6. Apparatus according to claim 3, characterised in that said turning device comprises an optical reader (12) able to detect the marked side of a disk and an horizontal displacing plate (13) resting on the same plane of the disk to be turned and which is "V" shaped at one extremity by which it can collect disk (2) and push it inside a sleeve (14) able to rotate of 180° around an horizontal axis.
7. Apparatus according to claim 6, characterised in that said detection of the marked side of the disk is made in a static manner, when the disk is stopped, in order to avoided reading errors due to the motion of the disk.
8. Apparatus according to claim 1, characterised in that from channels (11) said property positioned disks fall on horizontal prismatic seats (16) adjacent each other and vertically spaced of a distance at least equal to the thickness of a disk, wherein along seats (16) can slide two skates (15) able to push the disks against an abutting rim (17) in correspondence of which two glue dispenser (18) are provided to distribute glue on the disks (2).
9. Apparatus according to claim 1, characterised in that said positioning device consists of a hook (20) vertically movable and rotating around an horizon-

tal axis, the hook being able to take and to lift the column of the bodies (1) coming from channel (6).

10. Apparatus according to claim 1, characterised in that said assembling means consist of a horizontal displacing device (30) which is substantially vertically aligned with channel (6) and is capable of push a first body (1) against a couple of reference pins (31), and of a displacing device (19) capable of positioning the already glued disks (2) on said first body (1). 5 10
11. Apparatus according to claim 10, characterised in that said displacing device (30) is operated through a rod (37) activated by a cam mechanism (36) and said skates (15, 19) are operated by oleo-dynamic linear actuators. 15
12. Apparatus according to claim 10, characterised in that said displacing device (30) is provided with a second plate (32) made integral with said reference pins (31) by lateral arms (33), so that the assembled cork stopper is kept between a "V" shaped extremity of plate (38) and pins (31) and the further motion of displacing device (30) causes the plate (32) to advance to insert the assembled cork stopper between pliers (34) directed toward a drying kiln. 20 25

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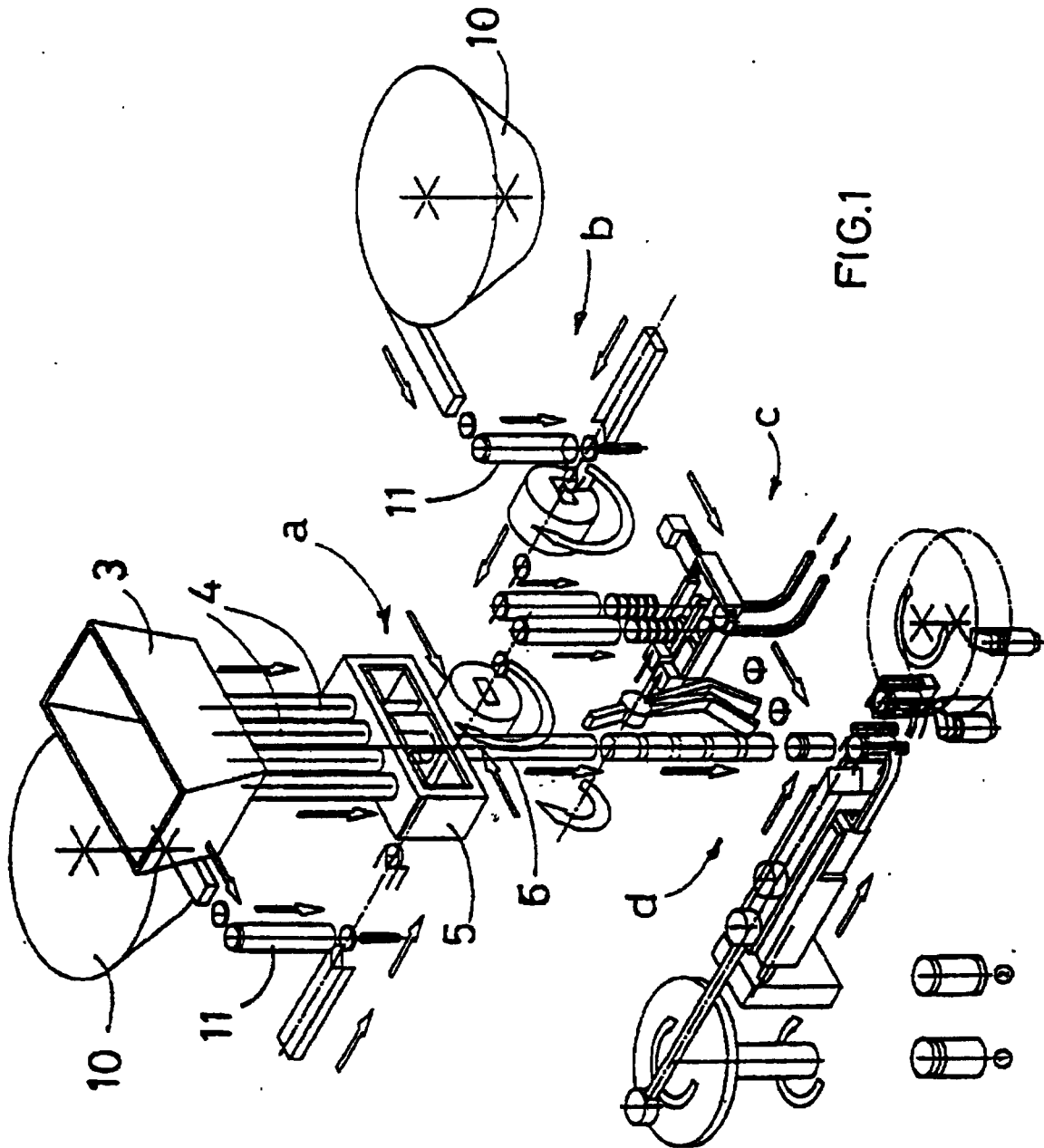
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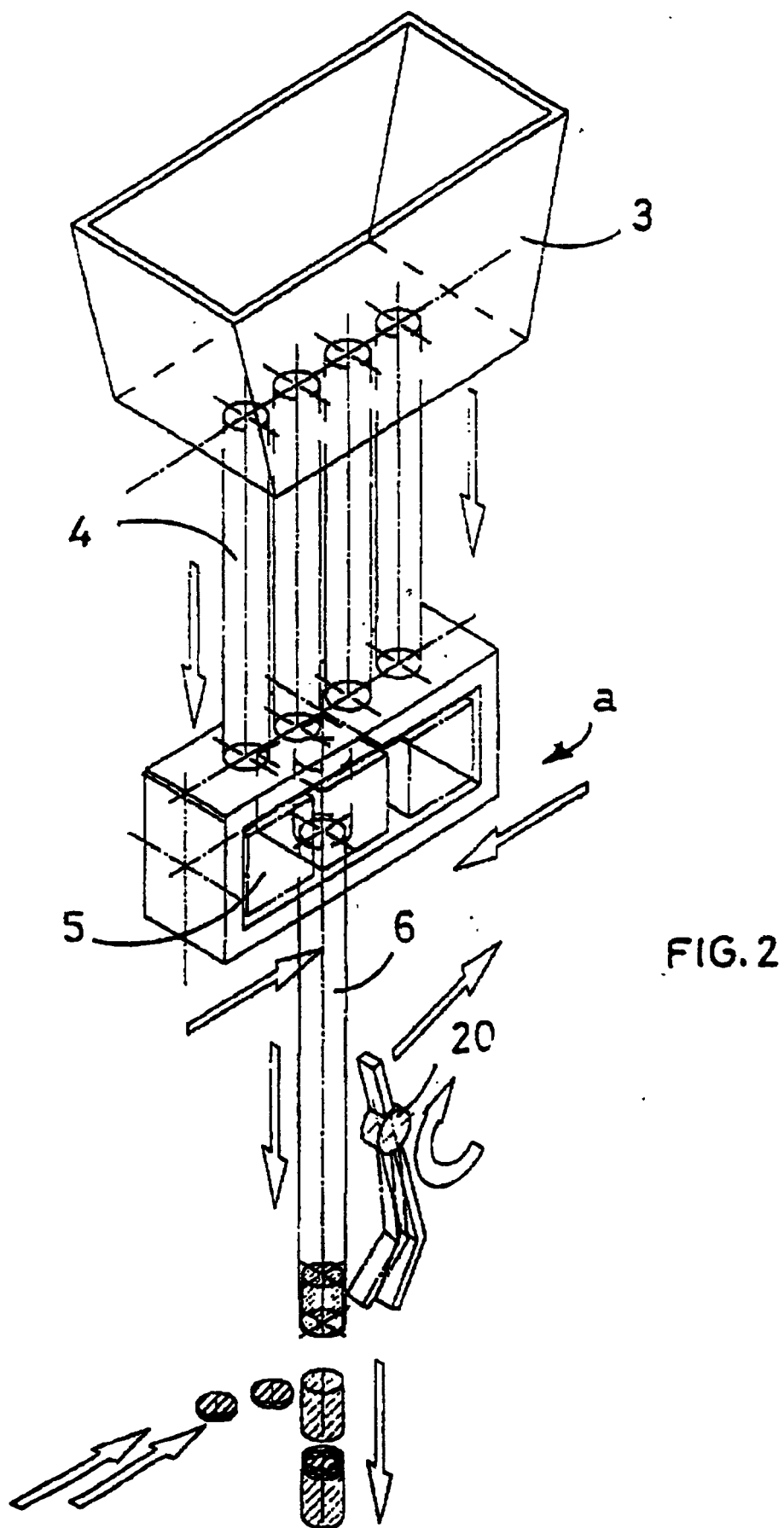
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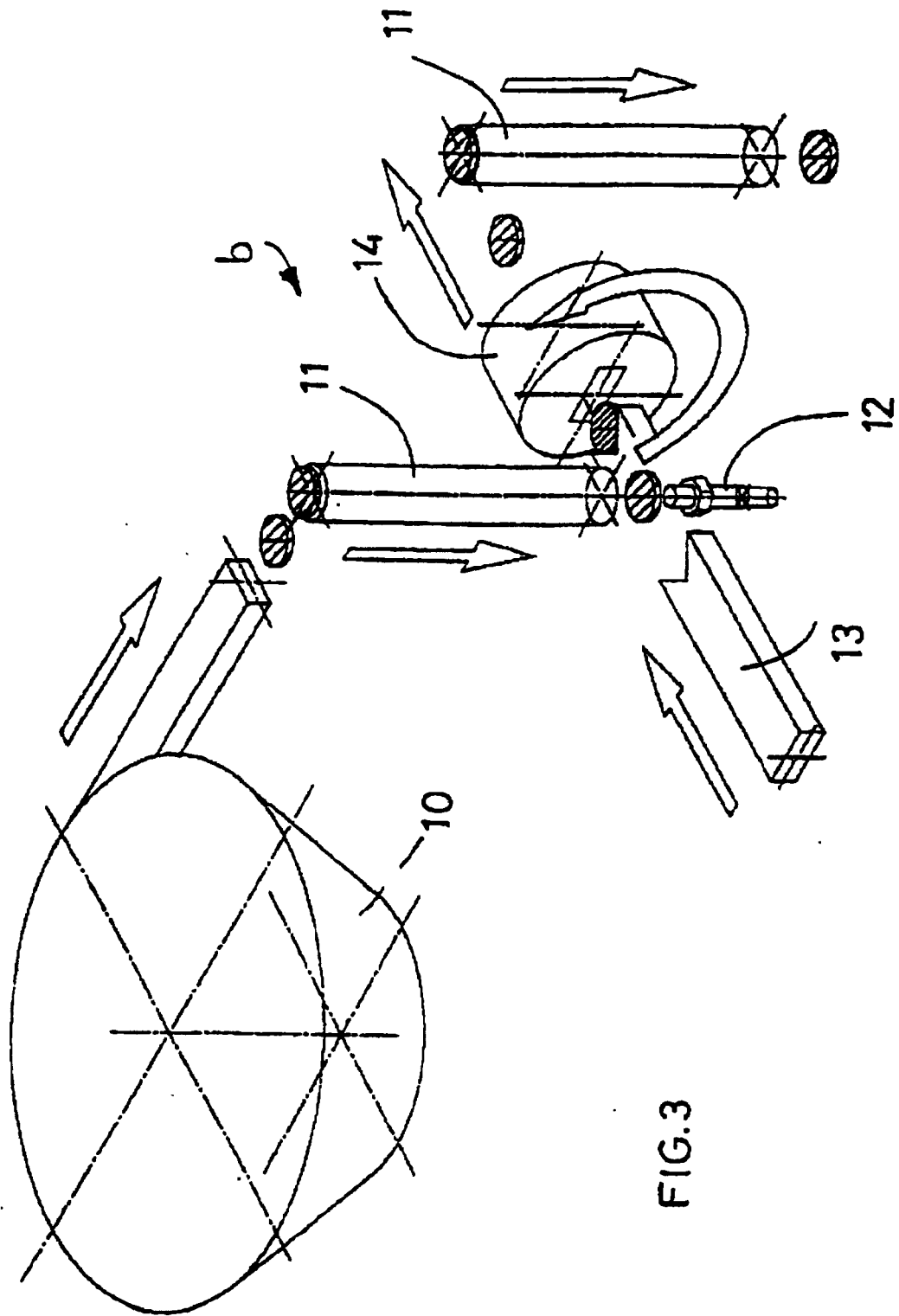


FIG. 3

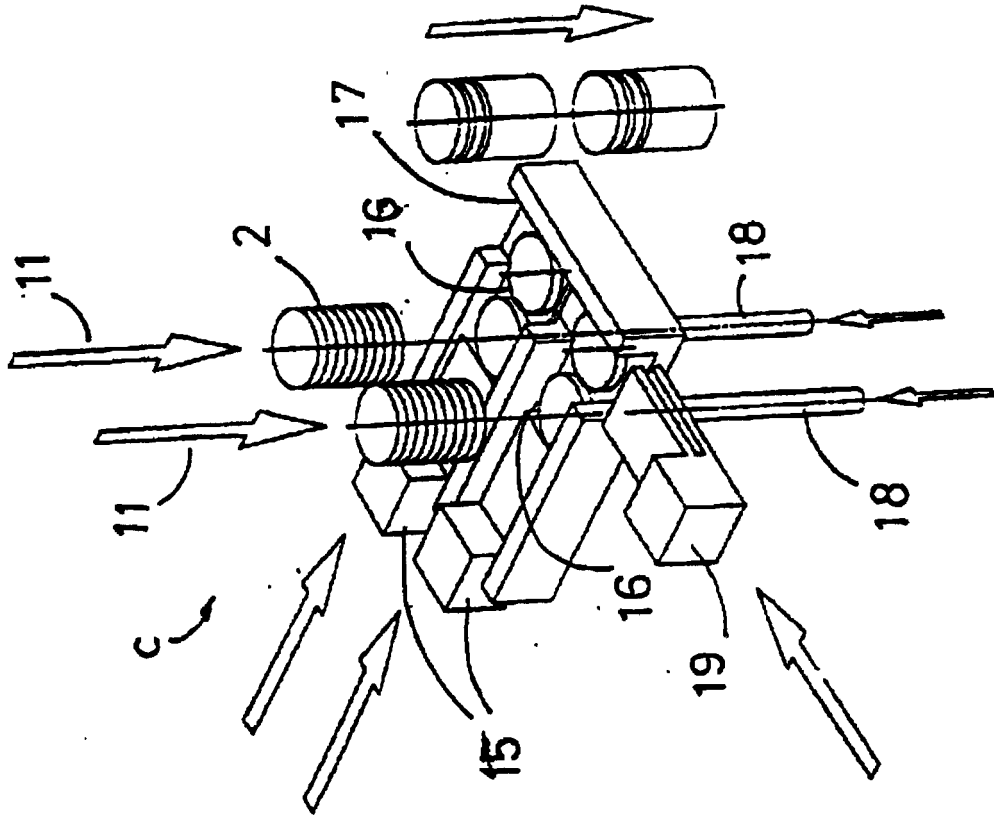


FIG. 4

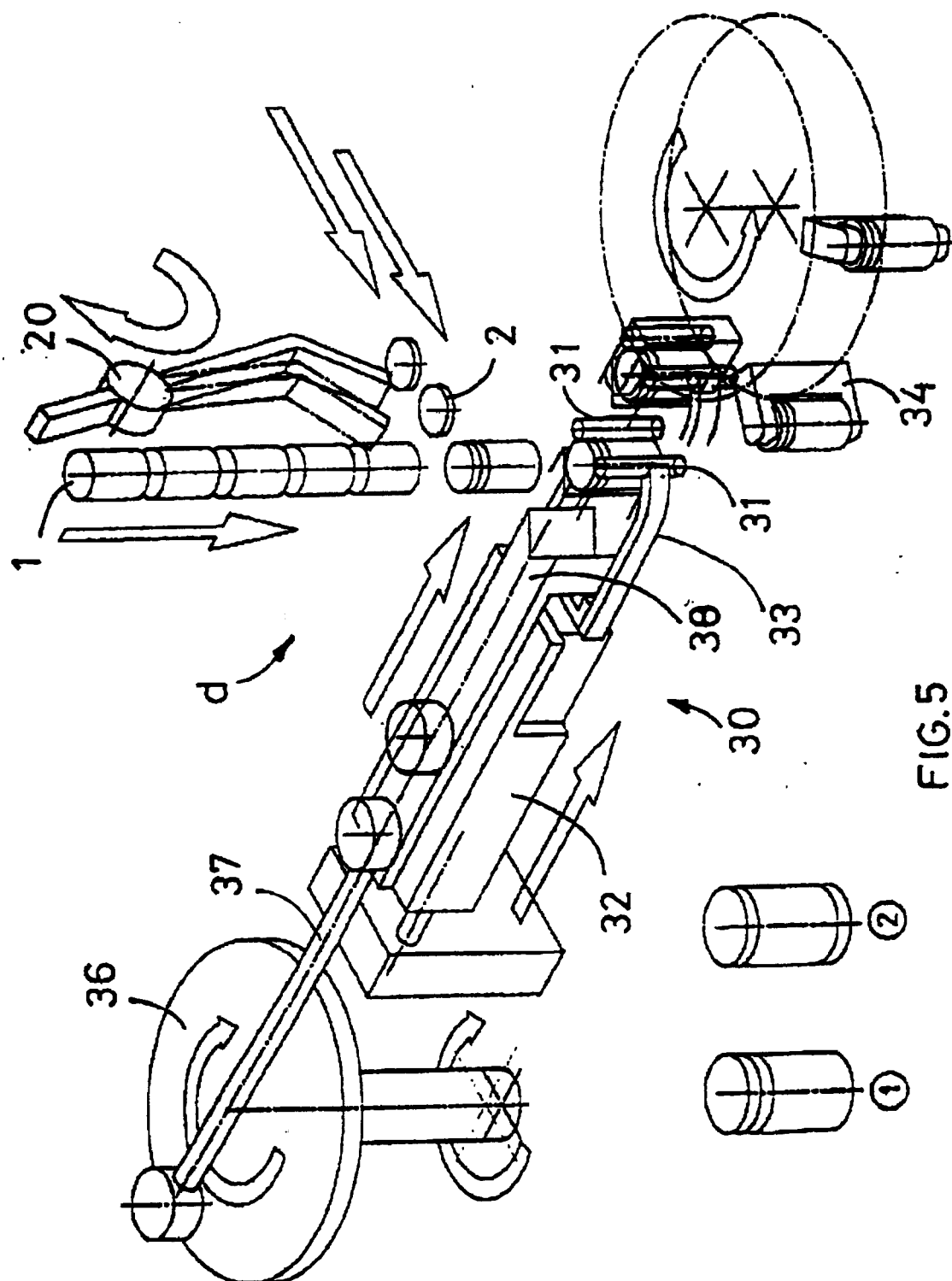


Fig. 5