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(72) Inventor: **Pandolfi, Cesare**
25010 San Zeno Naviglio (Brescia) (IT)

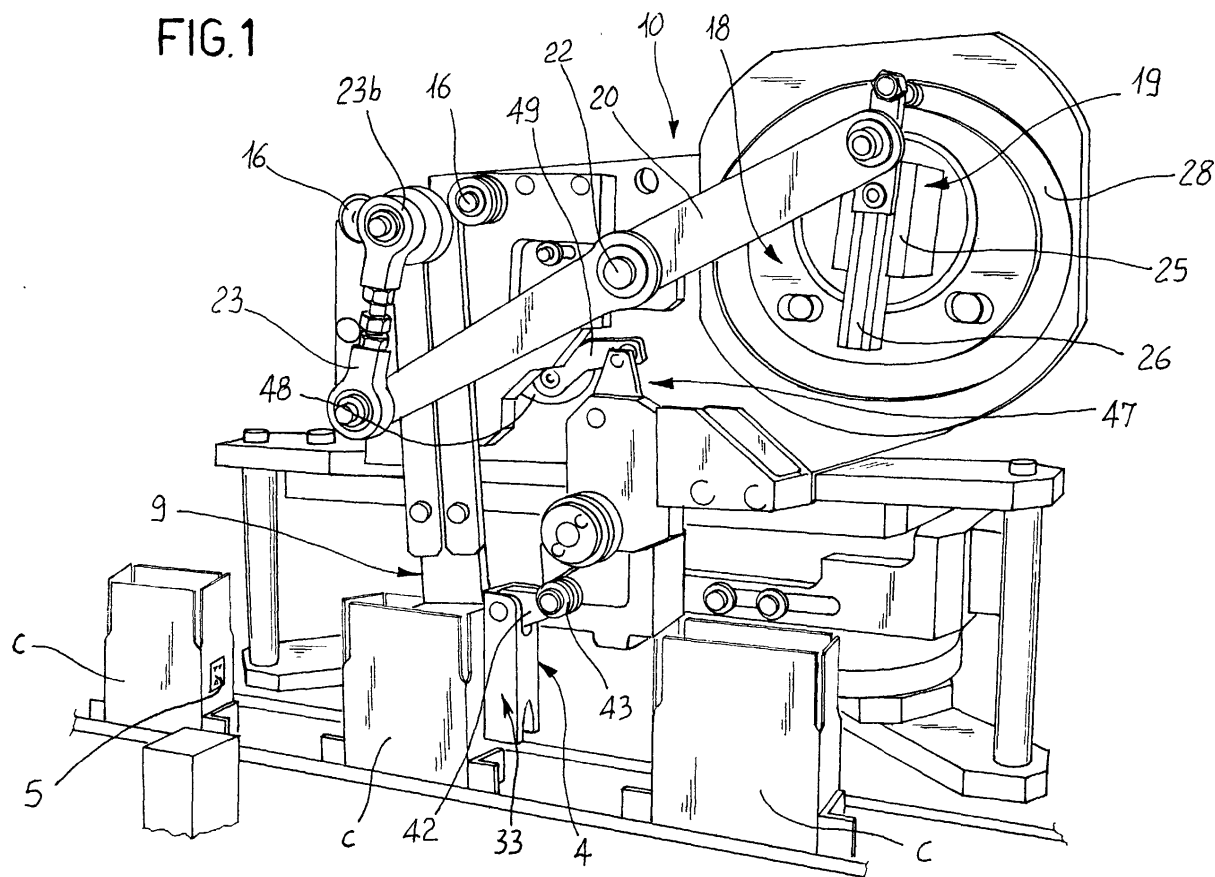
(74) Representative: **Cicogna, Franco**
Ufficio Internazionale Brevetti
Dott.Prof. Franco Cicogna
Via Visconti di Modrone, 14/A
20122 Milano (IT)

(71) Applicant: **Ricerca e Sviluppi Tecnologici S.r.L.**
25100 Brescia (IT)

(54) **A machine for inserting dispenser spouts in moving containers**

(57) A machine is provided for inserting dispenser spouts in containers transiting on a manufacturing line, comprising at least a head (4) for transporting and applying a dispenser spout (5) to a container in transit on a rectilinear segment (6) of the manufacturing line,

means (7) for guiding the transport and application head (4), at least a contrast arm (9) able to bear against the head (4) and means (10) for controlling the contrast arm (9) able to impose thereto reciprocating motions lying in a vertical plane parallel to the rectilinear segment (6) of the manufacturing line.



Description

Technical Field

[0001] The present invention relates to a machine for inserting dispenser spouts in containers transiting on a manufacturing line.

Background Art

[0002] As is well known, machines for inserting dispenser spouts, for instance made of aluminium, in containers, generally made of cardboard, provided for food products or for other types of items, for instance in powder or granule form, are installed along the lines for manufacturing the containers.

[0003] Such machines comprise a central assembly rotating about a vertical axis relative where to a plurality of heads for transporting and applying the dispenser spouts is positioned radially at uniform distances.

[0004] Each of the aforementioned heads draws a dispenser spout from the area where the spout is formed and brings it in proximity to the containers transiting on a rectilinear segment of the manufacturing line. The path that each head must follow to pass from the area where it draws each spout to the area where the spout is inserted is generally imposed by guide means constituted by one or more specific cam profiles where to rotating elements, such as idle rollers, integral to the same head, are slidingly coupled.

[0005] Said cam profiles must allow, during the fastening of each spout, the head transporting the spout to move along a rectilinear portion of path, parallel to the corresponding rectilinear segment of the manufacturing line.

[0006] It is also necessary to provide appropriate driving means connected to the central rotating assembly of the machine able to move the head in said rectilinear segment at the same speed as the line, i.e. as the transiting containers, so that each spout is approached to the container whereon it is to be applied without the occurrence of impacts or contact irregularities.

[0007] In addition to the transport and application head, a contrast arm is also provided, able to be inserted in container subjected to the application of the spout in such a way as to bear against said head which is approached externally to the container in the fastening phase. The head must be provided with organs for thrusting the spout set in motion by appropriate actuation means during the fastening thereof. The contrast arm, when the spout is thrust against the wall of the box, provides a reaction which allows its correct application. Obviously, appropriate control means must be provided, able to actuate the contrast arm in perfect co-ordination with the motion of the head for transporting and applying the spout.

[0008] In the prior art, to each head is associated a corresponding contrast arm which is therefore moved

along the same loop path which the head must follow. In particular, similarly to the head which must move transversely to the feeding line to enter the empty space provided between two successive containers in transit on the manufacturing line, also the contrast arm simultaneously with the motion of the head associated thereto is subject to transverse as well as vertical motions to be inserted in the box whereon a spout is to be applied and subsequently to exit the same box.

[0009] The prior art, described summarily above, presents numerous drawbacks.

[0010] First of all, the need to make the contrast arm effect complex motions both in the horizontal and in the vertical plane in order to bear against said head during the fastening of each spout entails having available a considerable segment of rectilinear path of each container during the application phase of the related spout and hence being able to perform only a limited number of these operating phases each minute.

[0011] It should also be noted that for the insertion and extraction phase of each head for transporting and applying the spout and of the related contrast arm on the manufacturing line, sizeable empty spaces are required between a container and the next, for instance about 50 - 55 mm. In other words the pitch between containers, especially if they are large, can never be reduced below a certain value in order to maintain at least the aforementioned value of said empty space.

[0012] It should be stressed, in particular, that in the prior art the presence of a number of contrast arms equal to the number of heads for transporting and inserting the spouts determines a considerable bulk of each assembly constituted by a pair of a contrast arm and by the related head and hence also a considerable overall volume of the machine which makes it complex and difficult to couple it to the lines for manufacturing the containers.

[0013] It should also be added that machines according to the prior art are generally designed and built for a determined pitch between the containers in transit on the manufacturing line and for a determined speed of advance of said line. In practice such machines have poor adaptability to manufacturing lines differing in the pitch between the containers and the speed of advance thereof and hence require costly and complex structural modifications and adjustments. It should further be noted that the prior art is also rigid with respect to the type and dimensions of the spouts since the changes thereof need complicated replacements of organs such as the entire contrast arm and the entire transport and insertion head.

Disclosure of Invention

[0014] In this situation the technical task set as the basis for the present invention is to devise a machine for inserting dispenser spouts able substantially to overcome the aforementioned drawbacks.

[0015] Within the scope of said technical task, an important aim of the invention is to devise a machine formed by a lesser number of components, with reduced overall dimensions and high agility of actuation of the organs destined to fasten each spout and in particular of the contrast arm, in order to obtain extremely high values of productivity, equal for instance to doubling, in the unit of time, the number of applications of spouts relative to the prior art.

[0016] Another important aim of the invention is to devise a machine that allows easily and rapidly to adjust to the speed of the manufacturing line the displacement speed of each head and of the contrast arm during the fastening of the spouts and also to adjust its operation to the variations in the pitch of the containers in transit on said manufacturing line.

[0017] A further aim is to devise a machine with high operative flexibility at contained costs in relation to the possibility of changing type and dimensions of the spouts to be applied to the containers.

[0018] The technical task set out above and the specified aims are substantially achieved by a machine for inserting dispenser spouts in containers transiting on a manufacturing line which is characterised in that said means for commanding said contrast arm impose reciprocating motions to the contrast arm which lie in a vertical plane parallel to said rectilinear segment of the manufacturing line.

Description of the Drawings

[0019] The description of a preferred, but not exclusive, embodiment of a machine for inserting dispenser spouts according to the invention is provided below and illustrated in the accompanying drawings, in which:

- Figure 1 shows a perspective view of the machine according to the invention;
- Figure 2 shows a partially sectioned plan view of the machine of Figure 1;
- Figure 3 shows a front elevation view of the machine of Figure 1;
- Figure 4 shows a section according to the plane IV-IV of Figure 2;
- Figure 5 shows a partially sectioned elevation view of a transport and insertion head of the machine of Figure 1; and
- Figure 6 shows a partially enlarged lateral view of an assembly for the collection and insertion of a dispenser spout comprised in the transport and application head of the machine of Figure 1.

Description of the Illustrative Embodiment

[0020] With reference to the aforementioned figures, and in particular to Figure 3, the machine for inserting dispenser spouts is globally indicated with the number 1.

[0021] It comprises a central assembly 2 rotating

about a vertical axis of rotation 3. Peripherally to said central rotating assembly are positioned various heads (4) for transporting and applying known dispenser spouts 5 (Figs. 3 and 5), for instance made of aluminium, provided with serration for fastening to the lateral wall of a container in transit on a rectilinear segment (6) of a manufacturing line shown in Figure 1.

[0022] For instance, four transporting and applying heads 4 can be provided, positioned equidistant at 90° from each other relative to the vertical axis of rotation 3.

[0023] The heads 4 are forced to follow a pre-set loop path imposed by guide means 7 constituted by cam guides such as to allow each head 4 to translate, within the overall loop path, along a rectilinear portion thereof, parallel to said rectilinear segment 6 of the manufacturing line.

[0024] Each head 4 is driven along the guide means by driving means 8 (Figure 3) connected to the central rotating assembly 2.

[0025] With particular reference to Figure 3, originally a single contrast arm 9 is provided, able sequentially to bear against each of the heads 4 during the fastening phase of a spout 5 to a container.

[0026] Control means 10 actuate the contrast arm 9 in co-ordination with the motion of the head 4, imposing to the contrast arm 9 reciprocating motions lying exclusively in a vertical plane parallel to the rectilinear segment 6 of the manufacturing line.

[0027] Also provided are activation means 11 which act on the head 4 during the phase whereby each spout 5 is fastened to a container.

[0028] More specifically the control means 10 comprise a support plate 12 slidably engaged on rectilinear support guides 13 fastened to the base 14 of the machine and developing along a first direction of motion 15 parallel to said rectilinear segment 6 of the manufacturing line. With the support plate 12 are integral guide organs 16 able slidably to guide the contrast arm 9 according to a second direction of motion 17 that is substantially vertical, or presents a slight inclination relative to a vertical axis.

[0029] Preferably, the guide organs 16 are defined by two pairs of idle rollers shaped as a V and able slidably to engage opposite lateral edges 9a of the contrast arm 9, advantageously covered by replaceable closure section bars.

[0030] A kinematic mechanism 18 transmits a first reciprocating motion to the support plate 12 along said first direction of motion 15 and a second alternating motion to the contrast arm 9 along said second direction of motion 17.

[0031] More in detail, the kinematic mechanism 18 comprises: a crank assembly 19 rotating about a horizontal axis 19a, a connecting-rod lever 20, engaged at a first end 20a to a hinge pin 21 defining the pin of the crank 19 and pivoted to the support plate 12 in a pivot pin 22 lying between the first end 20a and a second end 20b opposite to said first end 20a, and a driving arm 23

hinged at its own first terminal portion 23a to the second end 20b of the connecting-rod lever 20 and at its second terminal portion 23b to the contrast arm 9.

[0032] Advantageously, the driving arm 23 has adjustable length to enable varying the height positioning of an end 9b of the contrast arm 9 where a stopping block 24, interchangeable according to the type of dispenser spout 5 to be inserted in a transiting container, is fastened.

[0033] The crank assembly 19, in turn, comprises a guide 25 able to rotate about the horizontal axis 19a and defining a radial sliding race and a radial arm 26 coupled slidably to the rotating guide 25.

[0034] At an end of the radial arm 26 is engaged a first idle roller 27 able to rotate about a horizontal axis and slidably inserted in a first cam guide 28 fastened to the base 14 of the machine and defining, in a vertical plane, a ring race presenting a shape that is at least partially oval in the horizontal direction. The hinge pin 21, defining the crank pin, is coupled, in an adjustable locking position, to a radial slot 26a of the radial arm 26.

[0035] In practice, rotating about the axis 19a the hinge pin 21 follows a radius trajectory able to vary in accordance with the profile of the cam guide 28. In the horizontal segment thereof the connecting rod lever 20, which allows to transform the rotatory motion of the crank assembly 19 into the reciprocating rectilinear motion of the plate 12 along a first direction of motion 15, translates horizontally and, not rotating about the pivot pin 22, maintains motionless the contrast arm 9 in the second direction of motion 17. The stop block 24 of the contrast arm 9 is thereby subjected only to the horizontal translation motion parallel to the manufacturing line for a short segment of a few millimetres corresponding to the fastening of a spout.

[0036] The ability to vary the radius of the crank pin 21 allows to adjust the oscillation velocity and the stroke of the plate 12 thus also adjusting the velocity and the stroke of the translatory motions of the contrast arm 9 to the velocity and to the pitch of the manufacturing line.

[0037] Between the support plate 12 and the connecting rod lever 20 is advantageously interposed an auxiliary plate 29 able to slide relative to the same support plate 12 in said first direction of motion 15. The auxiliary plate 29 is able to be fixed to the support plate 12 in a predetermined variable position and engages the pivot pin 22. In this way it is possible to adjust in horizontal direction the position of said pivot pin on the support plate 12 and hence also to calibrate the starting and ending position of the stroke in the horizontal direction of the contrast arm 9. The rotatory motion about the horizontal axis 19a of the crank assembly 19 is provided by kinematic transmission means, not shown in the accompanying drawings, interposed between the crank assembly and the vertical axis of rotation 3 of the central assembly 2.

[0038] With particular reference to Figure 5, the head 4 for transporting and applying a spout 5 comprises a

support assembly 30 with which are integral, superiorly and inferiorly, first sliding engagement elements 31 in the guide means 7. The sliding engagement elements 31, each formed by a second idle roller able to rotate about a vertical axis, define a direction of advance of the support body 30 along the path imposed thereto by the guide means 7. A movable arm 32 is slidably engaged in the support body 30 along a direction of translation horizontal and transverse to said direction of advance of the support body 30. More specifically, a pair of superior idle rollers 31 and a pair of inferior idle rollers 31 are provided. The elements of each pair are aligned orthogonally to the movable arm 32. With a first end 32a of the movable arm 32 is integral an assembly 33 for collecting and inserting a spout 5, whilst a second sliding engagement element 34 in the guide means 7 is integral with a second end 32b of the movable arm 32. The second sliding engagement element 34 is formed by a third idle roller able to rotate about a vertical axis. The guide means 7 comprise a second double cam guide 35 fastened to the base 14 of the machine and divided into two guides specularly identical and positioned one superiorly and the other one inferiorly relative to the support body 30. To the double cam guide 35 are slidably coupled the superior and inferior idle rollers 31: the support body 30 is thus forced to follow a pre-determined loop path defined by said second cam guide 35. The guide means 7 also comprise a third cam guide 36, fastened to the base 14, where to said third idle roller 34 is slidably coupled. The third cam guide 36 develops in a loop internally to the second cam guide 35 and is able to define the transverse displacements of the movable arm 32 relative to the path of the support body 30.

[0039] Moreover the third cam guide 36 comprises a linear segment 36a prominent relative to the rest of its development and parallel to a corresponding linear portion 35a of the second cam guide 35. The linear segment 36a defines the rectilinear portion of the path of the head 4, and in particular of the collection and insertion assembly 33, parallel to the manufacturing line 6.

[0040] In this rectilinear portion of the path of the assembly 33, which develops for instance for about 20 mm, the entire phase of fastening a spout to a container is carried out.

[0041] Preferably, in addition to the second idle rollers 31, two contrast rollers 37 able to rotate freely about horizontal axes are engaged superiorly and inferiorly to the support body 30. The contrast rollers 37 co-operate with respective alignment guides 38 positioned at least in correspondence with the linear portion 35a of the second cam guide 35 to maintain stable and perfectly aligned the collection and insertion assembly 33 during the fastening of each spout.

[0042] The means 8 for driving each head 4 comprise a rotating arm 39 (Figs. 2 and 5) integral with the central rotating assembly 2 and formed by a base portion 39a fastened thereto and by a sliding portion 39b able to be locked to the base portion 39a in a variable position. In

this way the rotating arm 39 has an adjustable length able to vary the radial distance from the vertical axis of rotation 3 in its extreme position 39c.

[0043] Moreover, the driving means 8 comprise a pair of link rods 40 each terminally engaged to said extreme portion 39c of the rotating arm 39 and to the support body 30.

[0044] In practice the capability of adjusting the length of the rotating arm 39 allows to vary the driving velocity of the head 4 and to suit it to the velocity of the manufacturing line when the head 4 travels the linear portion 35a of its path along the second cam guide 35.

[0045] The assembly 33 for collecting and inserting the head 4 comprises a shell-like external body (Figure 6) fastened to the first end 32a of the movable arm 32. To the body of the shell 41 is pivoted an angle lever 42 of the first kind presenting a first segment 42a, corresponding to the resistance arm, inserted in the shell body 41 and a second segment 42b, corresponding to the power arm, emerging from the shell body 41 and provided with a terminal roller 43. With the first segment 42a is integral an element 44 supporting a dispenser spout 5 and constituted by a suitably shaped flat spring. Moreover, the first segment 42a of the angle lever 42 is maintained on the bottom of the shell body 41 by an elastic element 45.

[0046] Lastly, with particular reference to Figure 3, the means for activating the head 4 during the fastening of a spout 5 comprise an oscillating beating element 46 able to interfere with said terminal roller 43 of the angle lever 42 and a kinematic assembly 47 able to provide the beating element 46 with an reciprocating rotatory motion. This kinematic assembly 47 comprises, in turn, a crank element 48 able to rotate about a horizontal axis fastened to the base of the machine and kinematically connected to the vertical axis 3 of the rotating central assembly 2. To the crank element 48 is terminally hinged a connecting rod element 49, in turn hinged, at an opposite end, to a toothed sector 50 pivotally engaged to the base of the machine. The connecting rod element 49 confers a reciprocating oscillatory motion to the toothed sector 50 and to a gear wheel 51 meshing therewith and presenting an eccentric prominence defining the beating element 46.

[0047] The operation of a machine for inserting dispenser spouts, described above in mainly structural sense, is as follows.

[0048] The rotating central assembly 2, through the driving means 8, drives along the second cam guide 35 the support body 30 and all the heads 4 of the machine. In correspondence with the linear portion 35a of the second cam guide 35, the third cam guide 36 imposes a transverse excursion relative to the second guide 35 and hence relative to the support body 30 of the body 33 for collecting and inserting each head 4 which can thereby be inserted in the empty space between two containers in transit on the manufacturing line.

[0049] In the short path along the linear segment 36a

of the assembly 33 the contrast arm 9 lowers penetrating inside the container whereto, from the exterior, the assembly 33 has moved closer. The beating element 46 presses with a rapid strike against the roller 43 which determines the rotation of the angle lever 42 and the fastening to the container of the dispenser spout transported inside the shell body 41 by reaction against the stop block 24 of the contrast arm 9.

[0050] Subsequently the contrast arm 9 lifts and the assembly 33, following the third cam guide 36 moves transversely away from the manufacturing line.

[0051] As each transport and application head passes through the area of insertion of the spouts the sole contrast arm co-operates in the fastening thereof repeating the easy movement described above.

[0052] The invention achieves important advantages.

[0053] First of all, the machine according to the invention, being provided with a lesser number of mechanical organs and in particular with a single contrast arm able to co-operate with all the heads for transporting and applying the dispenser spouts, presents a lesser overall size and hence an easier adaptability to the insertion on manufacturing lines of containers of various kinds.

[0054] The lesser constructive complexity of the machine according to the invention relative to those of the prior art, in addition of entailing a reduction in the costs of production thereof, allows considerably to increase the rate of application of the spouts and hence the productivity of the plants for manufacturing the containers whereto said spouts are engaged.

[0055] It is stressed, in particular, that the machine has a high operative flexibility due both to the possibility of inserting the assembly for collecting the spouts in small gaps interposed between two transiting containers, and to the easy and rapid adaptability to the velocity of the packaging lines and to the variation of the pitch between the containers.

[0056] It should lastly be noted that the machine is also easily adaptable also to variations of the type and format of the dispenser spouts through the rapid replacement of a few components (stop block 24 and collection assembly 33) and hence with considerably reduced costs.

Claims

1. A machine for inserting dispenser spouts in containers transiting on a manufacturing line of the type comprising:

a central assembly (2) rotating about a vertical axis of rotation (3),
at least a head (4) for transporting and applying a dispenser spout (5) to a container in transit on a rectilinear segment (6) of said manufacturing line,
means (7) for guiding said transport and appli-

cation head (4) able to impose thereto a pre-set loop path comprising at least a rectilinear portion parallel to said rectilinear segment of the manufacturing line,

means (8) for driving said transport and application head (4) connected to said rotating central assembly (2),

at least a contrast arm (9) able to bear against said transport and application head (4) during the fastening of a dispenser spout to a container,

means (10) for controlling said contrast arm (9) able to actuate it in co-ordination with the motion of said transport and application head (4), and means (11) for activating said transport and application head (4) in said fastening phase,

characterised in that said contrast arm (9) is movable according to reciprocating motions lying in a vertical plane parallel to said rectilinear segment (6) of the manufacturing line.

2. A machine as claimed in claim 1, **characterised in that** it comprises a plurality of said transport and application heads (4) mutually equidistant and a single contrast arm (9) able to operate in sequence with each of said heads (4).

3. A machine as claimed in claim 1, **characterised in that** said control means (10) comprise:

a support plate (12) slidingly engaged on at least a rectilinear support guide (13) fastened to the base (14) of the machine and developing along a first direction of motion (15) parallel to said rectilinear segment (6) of the manufacturing line,

guide organs (16) integral with said support plate (12) and able slidingly to guide said contrast arm (9) according to a second substantially vertical direction of motion (17),

and a kinematic mechanism (18) able to transmit a first reciprocating motion to said support plate (12) along said first direction (15) and a second reciprocating motion to said contrast arm along said second direction (17).

4. A machine as claimed in claim 3, **characterised in that** said kinematic mechanism (18) comprises:

a crank assembly (19) rotating about a horizontal axis (19a),

a connecting rod lever (20) pivotally engaged at a first end (20a) to a hinge pin (21) and pivoted to said support plate (12) in a pivot pin (22) situated between said first end (20a) and a second end (20b),

and a driving arm (23) hinged at its first terminal

portion (23a) to said second end (20b) of the connecting rod lever (20) and at its second terminal portion (23b) to said contrast arm (9).

5. A machine as claimed in claim 4, **characterised in that** said crank assembly (19) comprises:

a guide (25) able to rotate about said horizontal axis (19a) defining a radial sliding race, a radial arm (26) slidingly coupled to said rotating guide (25),

a first idle roller (27) engaged at an end of said radial arm (26) and able to rotate about a horizontal axis,

and a first cam guide (28) fastened to the base (14) of the machine and defining a ring race in a vertical plane presenting a shape that is at least partly oval in the

horizontal direction, said first idle roller (27) being slidingly engaged to said first cam guide (28), said hinge pin (21) being coupled to said radial arm (26).

6. A machine as claimed in claim 5, **characterised in that** said radial arm (26) presents a radially developing slot (26a) able to house said hinge pin (21) in an adjustable locking position.

7. A machine as claimed in claim 4, **characterised in that** between said support plate (1) and said connecting rod lever (20) is interposed an auxiliary plate (29) able to slide relative to said support plate (12) in said first direction (15), able to be fastened thereto in a pre-set position and able to engage said pivot pin (22) of the connecting rod lever (20).

8. A machine as claimed in claim 3, **characterised in that** said guide organs (16) of the contrast arm (9) are defined by two pairs of idle rollers able slidingly to engage opposite lateral edges (9a) of said contrast arm (9).

9. A machine as claimed in claim 1, **characterised in that** said contrast arm (9) terminally presents a stop block (24) interchangeable according to the type of dispenser spout (5) to be inserted in the transiting container.

10. A machine as claimed in claim 4, **characterised in that** it comprises kinematic means for transmitting motion interposed between vertical axis of rotation (3) of the central rotating assembly and said horizontal axis (19a) of the crank assembly (19).

11. A machine as claimed in claim 1, **characterised in that** said transport and application head (4) comprises:

a support body (30),
 at least a first engagement element (31) able
 to slide in said guide means (7), integral with
 said support body (30) and defining the direc-
 tion of advance thereof, 5
 a movable arm (32) slidably engaged to said
 support body (30) along a direction of transla-
 tion that is horizontal and transverse to said di-
 rection of advance thereof,
 an assembly for the collection and insertion 10
 (33) of a dispenser spout, integral with a first
 end (32a) of said movable arm (32), and
 at least a second engagement element (34)
 able to slide in said guide means (7), integral
 with a second end (32b) of said movable arm 15
 (32).

12. A machine as claimed in claim 11, **characterised**
in that said guide means (7) comprise:

at least a second cam guide (35) fastened to
 the base (14) of the machine whereto is sliding-
 ly engaged at least said first engagement ele-
 ment (31) and able to define said pre-set loop
 path for said support body (30), 20
 and at least a third cam guide (36) fastened to
 the base (14) of the machine whereto is sliding-
 ly coupled said second engagement element
 (34), developing in a ring
 internally to said second guide (35) and able to 25
 define the transverse displacements of said
 movable arm (32) relative to the path of the sup-
 port body (30),
 said third cam guide (36) comprising at least a
 linear segment (36a) parallel to a correspond- 30
 ing linear portion (35a) of said second cam
 guide (35) and able to define said rectilinear
 portion of the path of the transport and applica-
 tion head (4) parallel to the rectilinear segment
 (6) of the container manufacturing line. 40

13. A machine as claimed in claim 12, **characterised**
in that at least two of said first engagement ele-
 ments (31) are provided, projecting superiorly and
 inferiorly from said support body (30) and **in that** 45
 two of said second cam guides (35) are provided,
 positioned superiorly and inferiorly relative to said
 support body (30) and able to engage correspond-
 ing said first engagement elements (31).

14. A machine as claimed in claim 12, **characterised**
in that two pairs of said first engagement elements
 (31) are provided, comprising a first pair of superior
 elements and a second pair of inferior elements, the
 elements of each pair being aligned orthogonally to 50
 said movable arm (32).

15. A machine as claimed in claim 14, **characterised**

in that each said first sliding engagement element
 (31) is defined by a second idle roller able to rotate
 about a vertical axis and **in that** said second sliding
 engagement element (34) is defined by a third idle
 roller able to rotate about a vertical axis.

16. A machine as claimed in claim 12, **characterised**
in that it comprises at least a pair of contrast rollers
 (37) pivotally engaged about horizontal axes su-
 periorly and inferiorly to said support body (30) and
in that it comprises at least two alignment guides
 (38) able to co-operate with respective contrast roll-
 ers (37) at least in correspondence with said recti-
 linear portion (35a) of the path of the transport and
 application head (4).

17. A machine as claimed in claim 1, **characterised in**
that said means (8) for driving the transport and ap-
 plication head (4) comprise:

at least a rotating arm (39) fastened to said cen-
 tral assembly (2) rotating about said vertical ax-
 is (3), said rotating arm (39) presenting at least
 an adjustable length able to vary the radial dis-
 tance of an extreme portion (39c) of the rotating
 arm (39) from said vertical axis of rotation (3),
 and at least a link rod (40) terminally pivotally
 engaged to said extreme portion (39c) of the
 rotating arm (39) and to the transport and ap-
 plication head (4).

18. A machine as claimed in claim 11, **characterised**
in that said collection and insertion assembly (33)
 of the transport and application head (4) comprises:

a shell-like external body (41) integral with said
 first end (32a) of said movable arm (32),
 an angle lever of the first kind (42) pivoted to
 said shell-like body (41) and presenting a first
 segment (42a) corresponding to the resistance
 arm inserted in the shell-like body (41) and a
 second segment (42b) corresponding to the
 power arm emerging from said shell-like body
 (41),
 an element (44) for supporting a dispenser
 spout, integral with the resistance segment
 (42a) of the angle lever (42),
 and at least an elastic element (45) able to
 maintain said resistance segment (42a) of the
 lever (42) on the bottom of said shell-like body
 (41).

19. A machine as claimed in claim 18, **characterised**
in that said means (11) for activating the transport
 and application head (4) during the fastening phase
 comprise:

an oscillating beating element (46) able to in-

terfere with said power segment (42b) of said angle lever (42),
and a kinematic assembly (47) able to confer a reciprocating rotatory motion to said oscillating beating element (46).

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- 20.** A machine as claimed in claim 19, **characterised in that** said kinematic assembly (47) comprises:

a crank element (48) able to rotate about a horizontal axis fastened to the base (14) of the machine,
a toothed sector (50) pivotingly engaged to said base,
a connecting rod element (49) terminally hinged to said crank element (48) and to said toothed sector (50) and able to confer a reciprocating oscillatory motion thereto,
and a gear wheel (51) meshing with said toothed sector (50) and presenting an eccentric prominence defining said oscillating beating element (46).

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- 21.** A machine as claimed in claim 20, **characterised in that** said crank element (48) is kinematically connected to the vertical axis of rotation (3) of said central rotating assembly (2).

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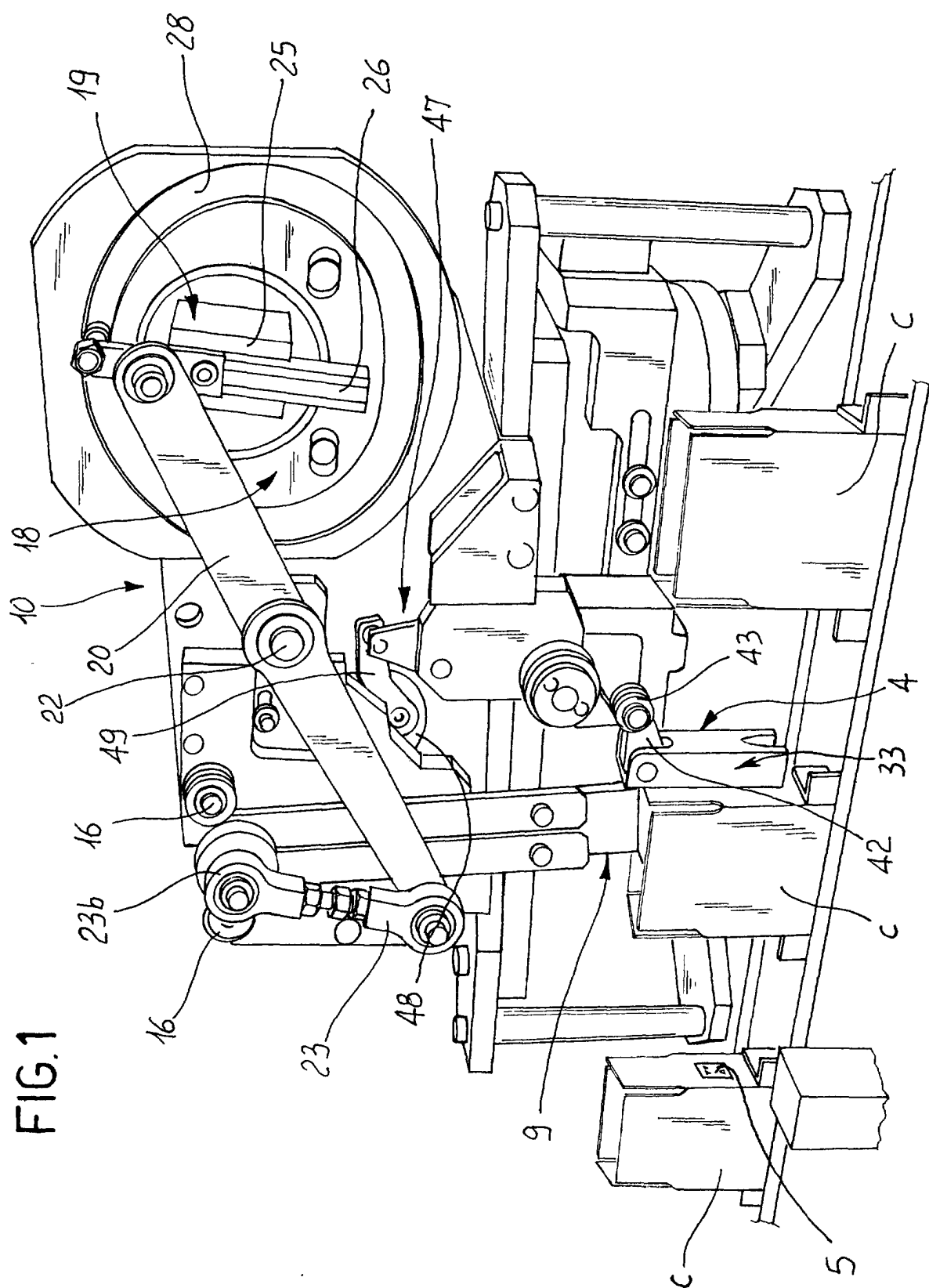
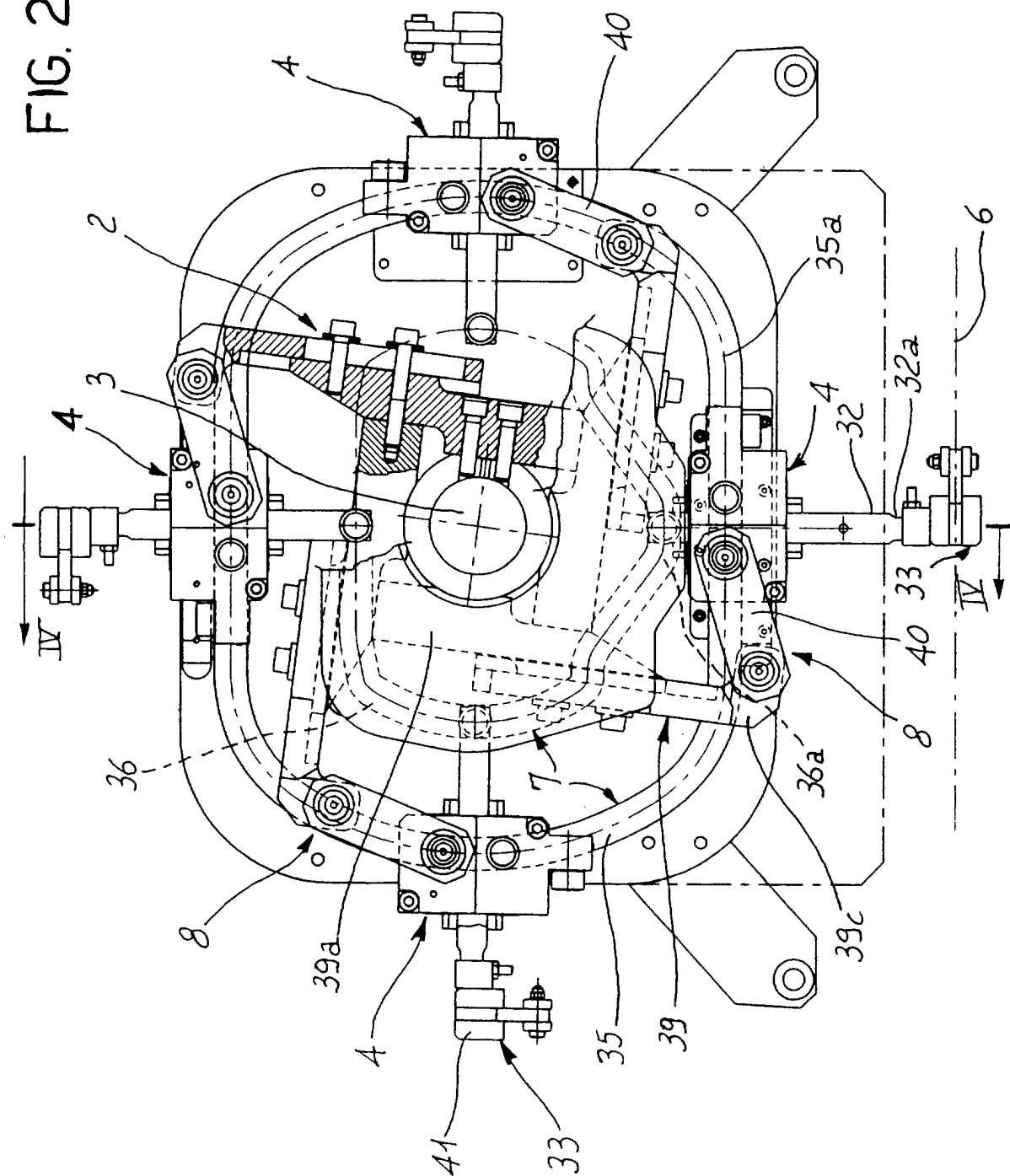
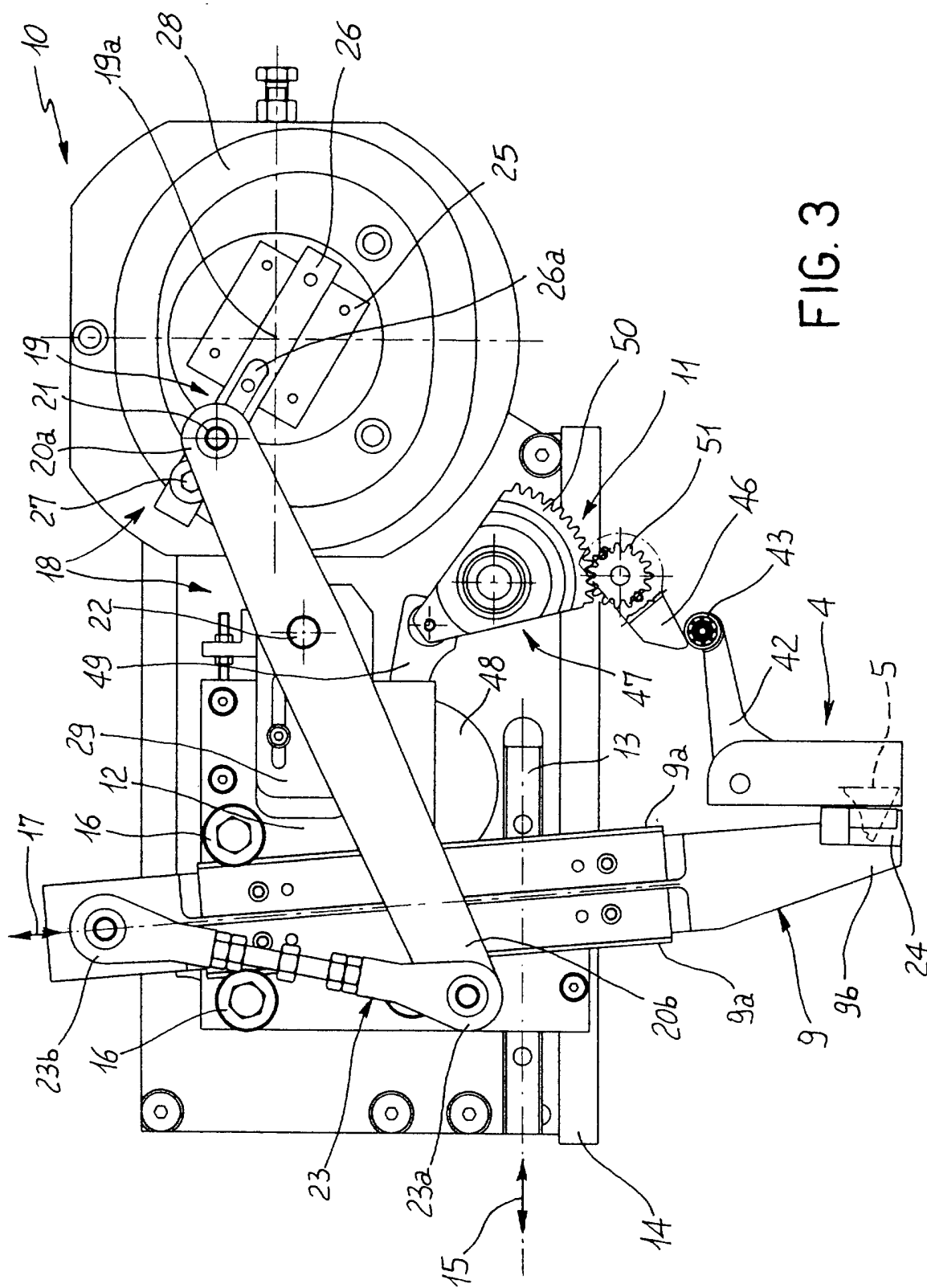


FIG. 2





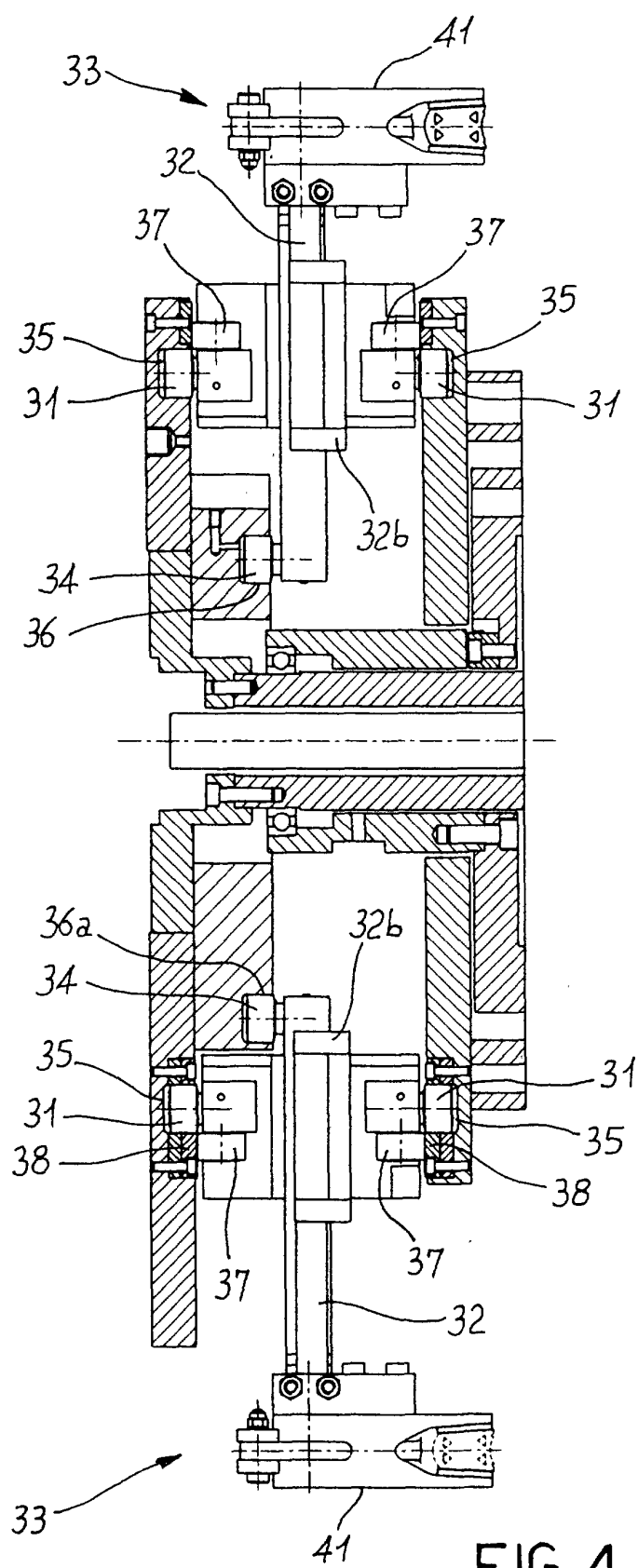
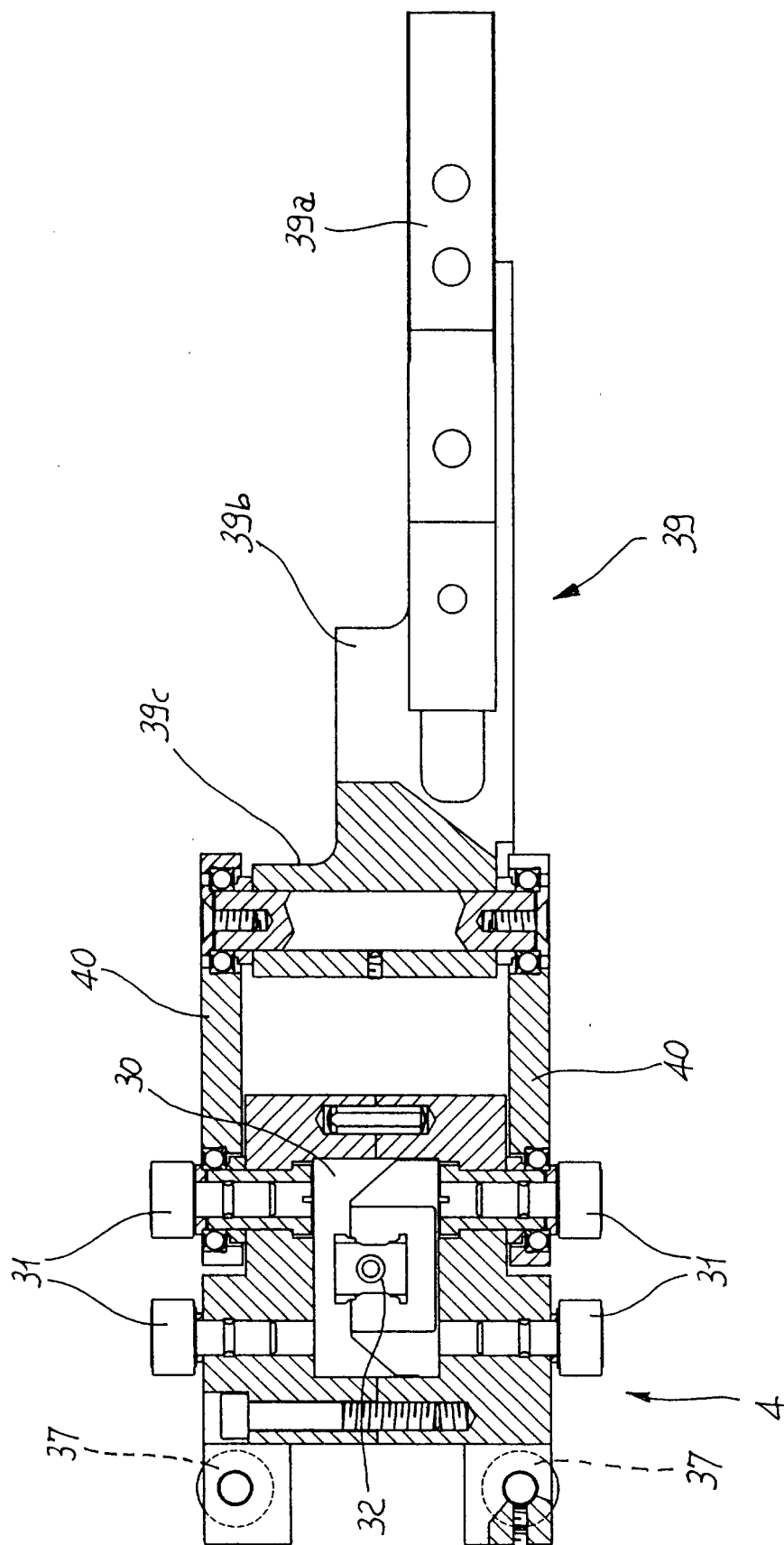
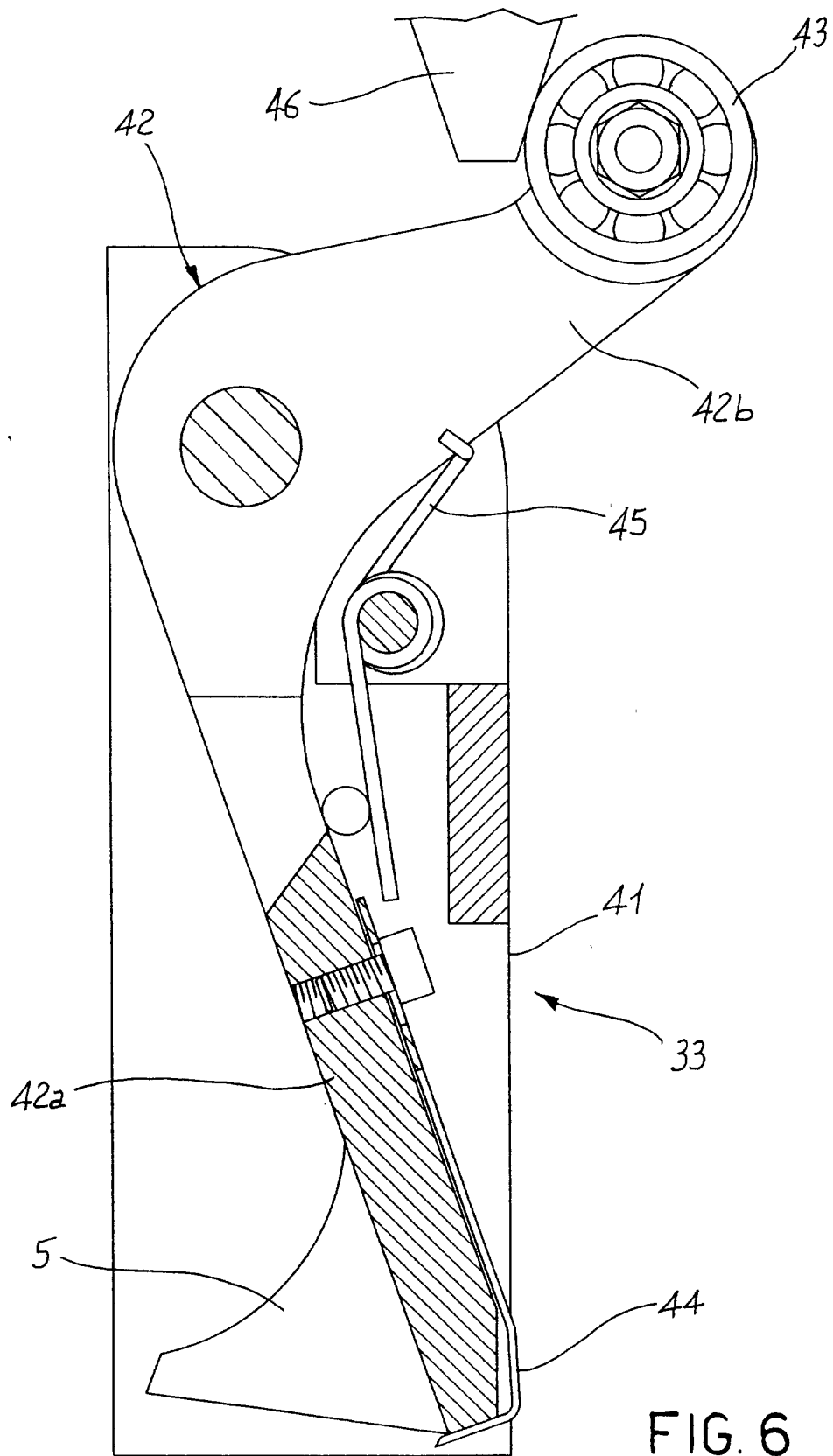


FIG. 5







European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0008

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	DE 11 57 068 B (SEAL-SPOUT CORPORATION) * column 6, last paragraph - column 7, paragraph 1; figures *	1	B31B1/84
A	US 2 861 529 A (KLAUSMANN MILTON H) 25 November 1958 (1958-11-25) * figures *		
A	US 3 673 663 A (TADDEI CARLO) 4 July 1972 (1972-07-04) * figures *		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B31B B65B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		27 June 2001	Pipping, L
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

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ON EUROPEAN PATENT APPLICATION NO.**

EP 01 83 0008

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
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27-06-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 1157068 B		NONE	
US 2861529 A	25-11-1958	NONE	
US 3673663 A	04-07-1972	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82