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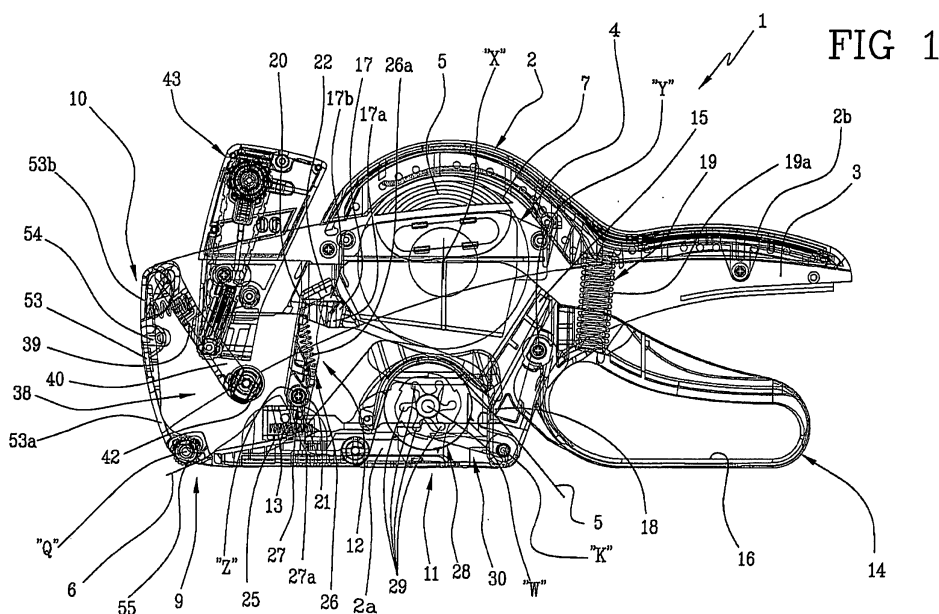
Remarks:

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(54) **Labelling machine**

(57) A labelling machine comprises a self-regulating arresting member (12) of a label (6) holder tape (5). The arresting member is able to press the tape (5) against an abutting surface (13) when a label has to be applied on a destination surface and it releases said tape (5) when, on the action of a control device (14) the tape (5) is actuated to advance. The labelling machine further com-

prises a printing device (38) whose inking roller (42) is associated to a device (44) that enables it to be engaged easily and conveniently on a respective support arm (39). The support arm in turn is advantageously connected to an access door (53) to internal areas of the labelling machine, whose opening determines the exit of the support arm (39) and the exposure of the inking roller (42).



## Description

**[0001]** The present invention relates to a labelling machine.

**[0002]** The present invention relates to a labelling machine with manual operation for applying labels bearing one or more captions, e.g. indications about the products whereon said labels are applied or the prices of the products.

**[0003]** In particular, the present invention is suitable for use in warehouses and/or in any commercial activity, such as department stores, supermarkets, shops and/or the like in which there is a need to affix various types of commercial and/or informational indications.

**[0004]** As is well known, there are manually operated labelling machines that comprise a load-bearing structure, within which is provided a device for feeding a label-holder tape. The label-holder tape is appropriately guided within the load-bearing structure to an area of application of the labels, whereat each label borne by the tape is detached therefrom to be affixed on a respective surface of a package or product of interest.

**[0005]** To allow the advance of the label holder tape within the load-bearing structure, known labelling machines are provided with an appropriate actuating device which pulls the tape downstream of the application area, making it advance towards an area of discharge of the tape without the labels.

**[0006]** Said labelling machines are also provided with a device for stopping and/or breaking the tape to enable the application of each label without undesired dragging of the tape. In particular, known labelling machines comprise, between the device for feeding the tape and the area of application of the labels, a series of mechanisms which continuously press the label holder tape against an abutting surface present within the load-bearing structure. In this way, when a label that has been partially detached from the label holder tape is positioned on a destination surface by a combined action of pressure towards said surface and translation of the labelling machine thereon, the label holder tape is maintained in a fixed position, allowing the complete detachment of the label to be applied.

**[0007]** Known labelling machines further comprise a control device, usually constituted by a movable element which has an appropriate grip, operatively connected to the actuation device to bring, to the application area, consecutively to each other, the labels borne by the tape. In particular, when the control device is operated manually, the co-operation between the latter and the actuation device intensely drive the label holder tape which, overcoming the blocking forces exercised by the arresting device, advances as described above.

**[0008]** Within the structure is also provided a printing element able to deposit on each label, upstream of the application area, a predefined quantity of ink according to pre-set motifs, whereby the aforementioned commercial and/or informational indications are obtained.

**[0009]** While known labelling machines allow the printing and the satisfactory application of the labels on the packages and/or surfaces of the products of interest, the Applicant has noted that they are not free of some drawbacks, mainly, in relation to the operation and the wear of the arresting device, to the replacement and/or maintenance of one or more components of the printing device, as well as to the wear of the labels and/or of the label holder tape.

**[0010]** In particular, it has been observed that the constant and continuous pressure of the arresting device on the label holder tape against the respective abutting surface, determines, in the long run, significant problems with the calibration of the components of said device, as well as excessive wear of the mechanical parts in rubbing or rolling relationship, requiring constant interventions to maintain and/or replace one or more components of the arresting device.

**[0011]** This problem also has an impact on the general conditions of the label holder tape and on the labels themselves, which may be structurally compromised, presenting an aesthetically displeasing outside appearance and/or, worse yet, an irregular printing surface whereon the ink used is deposited imprecisely, giving rise to undesired imperfections.

**[0012]** It should also be noted that both the difficulty in accessing the internal areas of the load-bearing structure of known labelling machines, and the difficulty in replacing some components of the printing device, e.g. the inking roller and the like, normally provided, entails and intense maintenance activity, whilst requiring considerable manual skills of the maintenance operator who must, with particular instruments and tools, access the inking roller to extract it from the structure and replace it with another inking roller.

**[0013]** An essential object of the present invention, therefore, is to overcome the drawbacks of the prior art.

**[0014]** In particular, an object of the present invention is to make available a labelling machine that is provided with a self-regulating braking system, i.e. able to manage the pressure of the tape against the corresponding abutting surface according to the advance or arrest of the tape.

**[0015]** A further object of the present invention is to provide a labelling machine whose replacement of the components of the printing device is easy and simple to perform.

**[0016]** Lastly, an object of the invention is to assure the structural integrity of the labels and of the label holder tape, while assuring the quality of the print effected by the printing device.

**[0017]** The technical task set out above and the specified objects are substantially achieved by a labelling machine comprising the characteristics described and claimed below.

**[0018]** Further characteristics and advantages shall become more readily apparent from the detailed description of a preferred, but not exclusive, embodiment of a

labelling machine, in accordance with the present invention. Said description shall be provided below with reference to the accompanying figures, provided purely by way of non limiting indication, in which:

- figure 1 is a schematic section of a labelling machine according to the present invention;
- figure 2 is an additional schematic section of the labelling machine of the previous figure, shown in open condition;
- figure 3 is a representation of a first detail of the labelling machine of the previous figures, shown in perspective and in exploded view;
- figure 4 is a front perspective view of the detail of the previous figure;
- figure 5 is a rear perspective view of the detail of figures 3 and 4;
- figure 6 is a representation of a second detail of the labelling machine of figures 1 and 2, shown in perspective and in exploded view;
- figure 7 shows a third detail of the labelling machine, shown in perspective and in exploded view;
- figure 8 is a perspective view of a component of the detail of figure 7.

With reference to the accompanying figures, the number 1 globally indicates a labelling machine, in accordance with the present invention.

**[0019]** As shown in figures 1 and 2, the labelling machine 1 comprises a substantially closed structure 2 presenting a handle 3, preferably coated with a co-moulded rubber shell 2b, positioned posteriorly for the manual engagement of the labelling machine.

**[0020]** Within the structure 2, in a substantially central area, is provided an element 4 for feeding a tape 5 provided with a plurality of labels 6 (whereof one is schematically shown in figure 1) to be printed and affixed onto the outer surfaces of corresponding packages, labels and/or products.

**[0021]** As shown in figures 1 and 2, the feeding element 4 preferably comprises a feeding reel 7 pivotally engaged to the structure 2 to rotate around a respective axis of rotation "X".

**[0022]** Advantageously, the feeding reel 7 is removably engaged to the structure 2 in such a way that it can be removed therefrom when the feeding reel 7 is completely empty.

**[0023]** As shown in figure 2, the feeding reel 7 can advantageously be inserted or extracted through an appropriate access opening 8 obtained in a lower part of the structure and appropriately kept closed by additional components of the labelling machine which shall be described below.

**[0024]** To guide the tape 5 at least between the feeding element 4 and an area 9 of application of at least one label 6, the structure 2 is provided with appropriate guidance means which define, according to a predetermined route, a path of advance of said tape 5.

**[0025]** As shown in figure 1, the guiding means lead the tape 5 from the feeding element 5 to the application area 9 which is preferably located inferiorly to the structure 2 of the labelling machine 1 in proximity to a front portion 10 thereof.

**[0026]** The labelling machine further comprises at least device 11 for actuating the tape 5 operatively located within the structure 2. The actuating device 11 is movable from a non operative condition in which the tape 5 does not move, remaining in a predetermined position, and operative condition, in which the actuating device 11 induces the tape 5 to move along the path of advance defined by the guiding means to bring at least one label 6 of the tape 5 to the area of application 9.

**[0027]** Again with reference to figures 1 and 2, the labelling machine further comprises an element 12 for arresting the tape 5 operatively positioned within the structure 2. The arresting element 12 is movable between a condition of arrest, in which it inhibits the actuation of the tape 5 pressing the latter against an abutting surface 13 associated with the structure itself, and a condition of release, in which the pressure of the tape 5 against the abutting surface 13 decreases according to a value such that the tape 5 is free to advance along the aforementioned path of advance.

**[0028]** In order to operate both the actuating device 11 and the arresting element 12, the labelling machine comprises at least one control device 14 operatively associated to the structure 2, preferably inferiorly to the handle 3. The control device 14 is operatively connected to the arresting element 12 and to the actuating device 11 to bring, to the application area 9, at least one label 6 present on the tape 5.

**[0029]** More in particular, the control device 14 comprises a control lever 15 hinged to the structure 2 of the labelling machine 1 in a rear area thereof to oscillate around a respective axis of rotation "Y". The control lever 15 has, inferiorly to the handle 3, a grip portion 16 shaped ergonomically to facilitate and ease the manual grasping thereof. The control lever 15 develops prevalently within the structure 2 presenting a first control portion 17 located in proximity to the arresting element 12 and a second control portion 18 located in proximity to the actuating device 11.

**[0030]** Advantageously, at least one contrasting elastic element 19, preferably a helical spring 19a, is operatively interposed between the grip portion of the control device 14 and the handle 3 of the structure 2 to maintain the latter in a predetermined position.

**[0031]** Advantageously, the control device 14 can be moved between a first position in which the arresting element 12 is in arresting condition and the actuating device 11 is in non operative condition (figure 1), and a second position in which the arresting element 12 is in release condition and the actuating device 11 is in operative condition, i.e. in condition of pulling the tape 5 that unwinds the respective feeding reel 7.

**[0032]** In greater detail, the movement of the control

device 14 from the first to the second position takes place by manually pressing the grip portion 16 of the control lever 15 that consequently rotates around the axis of rotation "Y" counter-clockwise. The grip portion 16 approaches the handle 3 pressing the helical spring 19a and the respective control portions 17, 19 move determining a change of state relative to the arresting element 12 that reduces its load on the tape 5 and the actuating device 11 that drives the tape 5 along the path of advance.

**[0033]** On the contrary, if the manual action of approach of the grip portion 16 to the handle 3 is interrupted, the control device 14 tends to return to the initial position, i.e. completely removed from the handle 3, rotating clockwise around the axis of rotation "Y".

**[0034]** With reference to figures 1-5, and in particular to figures 3-5, the aforementioned arresting device 12 comprises, in detail, a first element 20, preferably made of plastic material, pivotally engaged to the structure 2 by means of a hinging pivot 21 which defines a respective axis of rotation "X" and "Y" respectively of the feeding reel 7 and of the control lever 15. At the opposite site from the hinging pivot 21 the first element 20 has a small engagement disk 22, preferably metallic, engaged, advantageously by co-moulding, in a respective seat 23. The engagement disk 22 is operatively connected to the first control portion 17 of the control device 14 so that the movement thereof between the first and the second condition determines the actuation of the arresting device 12 between the arresting condition and the release condition.

**[0035]** Again with reference to figures 3 through 5, the arresting elements 12 comprises a second element 24, preferably metallic, pivotally engaged to the structure 2 by means of the hinging pivot 21 in such a way as to rotate around the axis of rotation "Z". Advantageously, the second element 24 has an inclined portion 25 that engages the tape 5 to block it against the abutting surface 13 when the arresting device 12 is in arresting condition and to allow the advance of the tape itself along the path of advance when the arresting device 12 is in release condition.

**[0036]** The arresting element 12 comprises at least one elastic connection member 26 interposed between the first and the second element 20, 24 to connect the latter and at the same time to allow relative rotations around the axis of rotation "Z".

**[0037]** The interaction between the elastic connecting member 26, the first and the second element 20, 24, the control device 14 and the tape 5 on the abutting surface 13, determines, in arrest condition, a thrust by the elastic connecting member 26 on the second element 24 against the abutting surface 13. In other words, when the control device 14 is in the first position, the first portion 17 of the control lever 15 pushes the engagement disk 22 of the first element 20 of the arresting member 12 upwards by the action of the contrasting spring 19a. In practice, the first control portion 17 of the control lever 15 has a shaped screw 17a a shaped head 17b whereof is directly en-

gaged to the engagement disk 22 present in the end of the first element 20 of the arresting member 12 that is opposite to the second element 24.

**[0038]** Being fastened in the pivot 21, the first element 20 tends to rotate counter-clockwise (figures 1-3 and 5) tensioning the elastic member 26 which induces the second element 24 in rotation around the axis "Z" and counter-clockwise. The rotation of the second element 24 is, however, contrasted by the contrasting surface 13, transforming itself into a thrust equal to the force exercised by the elastic member 26 on the second element 24 and on the contrasting surface 13. Naturally, a push of the tape 5 against the contrasting surface 13 causes its blocking.

**[0039]** On the contrary if the control device 14 is moved from the first to the second position, the first control portion 17 of the control lever 15 no longer pushes against the metallic disk 22, enabling the elastic member 26 to unload, freeing the tape 5 which can thus slide.

**[0040]** Again with reference to figures 3 to 5, the arresting device 12 comprises two elastic member 26, preferably traction springs 26a, operatively interposed between a respective hitching portion 20a of the first element 20 and a corresponding engagement portion 24a of the second element 24 positioned in proximity to each other.

**[0041]** The arresting device 12 further comprises an auxiliary elastic member 27, preferably a torsion spring 27a, operatively interposed between an abutting portion 20b (figure 4) of the first element 20 and an abutting surface 24b (figure 5) of the second element 24, oriented substantially opposite relative to the contrasting surface 13. The auxiliary elastic member 27 co-operates with the elastic members 26 to enhance the thrusting action of the second element 24 against the contrasting surface 13 when the arresting device 12 is in arresting condition and assure the tensioning of the tape 5 when the control device 14 is in the second position in such a way as to obtain the correct detachment of the labels from the tap in the application area 9.

**[0042]** With reference to figures 1, 2, and in particular to figures 7 and 8, the actuating device 11 comprises at least one driving roller 28 pivotally engaged to the structure 2 along the path of advance of said tape 5 and downstream of the area of application 9 of the labels 6. The driving roller 28 partially defines the path of advance of the tape 5 and it can be actuated in rotation according to a predefined angle of rotation to advance the tape 5 according to a respective predetermined measure of advance.

**[0043]** The driving roller 28 is advantageously connected to the control device 14, so that it is actuated in rotation around a respective axis of rotation "W", substantially parallel to the axes of rotation "X", "Y" and "Z" when the arresting member 12 is in release condition.

**[0044]** Describing more in detail the structure of the actuating device 11, the driving roller 28 has a plurality of actuating projections 29 positioned at both the planar lateral surfaces 28a thereof, operatively engaged by an

actuating member 30 interposed between the driving roller 28 and the second control portion 18 of the control lever 15 of the control device 14. The actuating member 30 operates, on the action of the control device 14, consecutively on each actuating projection 29 to rotate at constant pitch the driving roller 28 around the respective axis of rotation "W" clockwise and according to a predefined angle of rotation.

**[0045]** More in detail, the actuating member 30 is preferably constituted by a pawl 31 hinged at its ends to the structure 2 between the driving roller 28 and the grip portion 16 of the control device 14.

**[0046]** When the control device 14 moves from the second to the first position on the action of the spring 19a, the pawl 31 enmeshes the actuating projections 29 of the driving roller 28 obtaining a stepped rotation thereof around the axis "W".

**[0047]** In order to inhibit any counter-rotations of the driving roller 28 during the movement of the control device 14 from the first to the second position the driving roller 28 is provided with a plurality of locking projections 32 (figure 8) operatively engaged by corresponding locking members 33. In particular, the locking projections 32 are obtained circumferentially inside the driving roller 28 and they are accessible through two annular recesses 34. The locking members 33 constitute a one-way pawl mechanism provided with two elastic tongues that intervene on the profile of the locking projections 32.

**[0048]** On the cylindrical surface at the sides of a central annular recess 35, the driving roller 28 has a series of notches 36 able to engage inside corresponding slits (not shown) obtained on the tape 5.

**[0049]** Peripherally to the cylindrical surface of the driving roller 28 is provided an elastic tape-guiding device 37 with arched shape which is fastened removably, at its ends to the structure 2 and it is able to maintain the tape 5 pressed on the driving roller 28.

**[0050]** In particular, the elastic tape-guide device 37 has a first end 37a hinged to the structure 2, by means of two pins 37b, and a second end 37c, hinged to the structure 2, by means of a shaft 37d that engages within respective hinging holes 37e obtained on the structure of the tape-guide device itself. The tape-guide device 37 is advantageously made elastic by two laminar sections 37f that can rotate because they are hinged on the shaft 37d through the opening 37e so the settling and the phasing of the advance of the tape 5 are assured.

**[0051]** As shown in figure 2, both the abutting surface 13 and the actuating device 11 are supported by a portion 2a of the structure 2, able to rotate around a hinging axis "K", coinciding with the axis of hinging of the actuating member 30. The displacement of the portion 2a of the structure 2, as shown in figure 2, defines the aforementioned access opening 8 for the insertion and/or the extraction of the reel 7 for feeding the tape 5.

**[0052]** Again with reference to figures 1 and 2, and in particular with figure 6, the labelling machine 1 comprises a printing device 38 operatively associated to the struc-

ture 2 to deposit on at least one label 6 a predefined quantity of ink according to a pre-set motif. The printing device 38 is movable, upon operation of the control device 14, between a condition of rest (figure 1) coinciding with the first position of the control device 14 in which the printing member 38 is distanced from the tape 5, and a printing condition coinciding with the second position of the control device 14, in which the printing member 38 operates on a respective label of the tape 5.

**[0053]** Advantageously, the printing member 38 comprises at least one support element or support arm 39 operatively associated to the structure 2 and having a free end 40 preferably provided with two support projections 41. The printing member 38 further comprises at least one inking roller 42 removably engaged to the support element 39 between the support projections 41.

**[0054]** As visible in figures 1 and 2, the printing member 38 is also provided with means for feeding the ink 43 to be provided to the inking roller 42 which are only mentioned here because they do not represent the subject of the present invention.

**[0055]** Advantageously, the printing member 38 comprises at least one engagement device 44 (figure 6) able to be operatively interposed between the support element 39 and the inking roller 42 to allow, integrally with the inking roller 42, the removable engagement thereof to the support element 39. In other words, the engagement device 44 enables the inking roller 42 to be engaged or removed from the support element 39 within coming in contact with the cylindrical surface of the inking roller 42.

**[0056]** Preferably, the engagement device 44 has snap-in engagement means 45 for the engagement of the inking roller 42 to the support element 39.

**[0057]** With reference again to figure 6, the engagement device 44 comprises a substantially "U" shaped roller-holder structure 46 having two lateral portions 46a, each provided with a respective seat 47 for the pivotal engagement of a respective longitudinal pivot 48 of the inking roller 42 and a central connecting portion 46b interposed between the lateral portions 46a.

**[0058]** The engagement device 44 further comprises two elastic connecting elements 49 each operatively engaged externally to a respective lateral portion 46a of the roller-holder structure 46. Each elastic connecting element 49 is movable between a first position in which it is distanced from the respective lateral portion 46a of the roller-holder structure 46 and a second position in which it is approached to the respective lateral portion 46a of the roller-holder structure 46.

**[0059]** Each elastic connecting element 49 has, at opposite side relative to the respective lateral portion 46a of the roller-holder structure 46 at least one hitching projection 50, adapted to engage at least one respective hitching seat 51 obtained internally in a respective support projection 41 of the support element 39 and at least one thrust edge 52 through which the hitching projection 50 is displaced from the first to the second position, en-

gaging the respective hitching seat 51 when the roller-holder structure 46 is engaged between the support projections 41 of the support element 39.

**[0060]** As shown in figures 1, 2 and 6, the labelling machine advantageously comprises at least one door 53 having a first end 53a hinged to the structure 2 and a second end 53b, opposite the first end 53a, provided with at least one element 54 for locking the door 53 on the structure. The door 53 is able to rotate around a hinging axis "Q", defined in the first end 53a, between a closed position (figure 1) in which the structure 2 is closed by the door 53, and an open position (figure 2), in which the door 53 is at least partially removed from the structure 2.

**[0061]** Advantageously, the support element 39 of the inking roller 42 is hinged, at the opposite side from its free end 40, to the second end 53b of the door 53. According to said connection, the support element 39 is positioned within the structure 2 when the door 53 is in closed position and it is positioned at least partially, preferably completely (figure 2) outside the structure 2 when the door 53 is in open position to facilitate accessibility to the inking roller 42.

**[0062]** As shown in figure 6, at the axis of hinging "Q" is also pivotally engaged an application roller 55 by means of which it is possible to press the label exiting the corresponding application area against an underlying surface.

**[0063]** The present invention solves the problems observed in the prior art and achieves the proposed objects.

**[0064]** First of all, the subject of the present invention enables structurally to preserve the components of the arresting member as well as the labels borne by the feeding tape.

**[0065]** In particular, the arresting system whose braking or locking action regulates automatically in relation to the positions assumed by the control device prevents the arresting member from being subjected to excessive rubbing friction which lead to rapid structural wear.

**[0066]** It should also be considered that the arrangement of a device for engaging the inking roller like the one described above together with a system for opening and extracting said inking roller like the one represented by the door hinged to the support element of the printing device, facilitates any operation for the maintenance, cleaning and/or replacement of the inking roller without coming in contact with dirty parts thereof, i.e. without intercepting surfaces that are inked for printing the labels.

## Claims

### 1. Labelling machine (1) comprising:

- a structure (2);
- at least one member (4) for feeding a tape (5) provided with a plurality of labels (6) associated to said structure (2);
- guiding means associated to said structure (2)

to drive said tape (5) at least between said feeding member (4) and an area (9), defined in said structure (2), for the application of at least one label (6), said guiding means defining a path of advance of said tape (5);

- at least one device (11) for actuating said tape (5) positioned in said structure (2), said actuating device (11) being movable between a non operative condition in which said tape (5) remains in a predetermined position, and an operative condition, in which said actuating device (11) induces in actuation said tape (5) along said path of advance to bring at least one label (6) of said tape to said area of application (9);

- at least one device (12) for arresting said tape (5) operatively positioned in said structure (2), said arresting device (12) being movable between an arresting position, in which it inhibits the actuation of said tape (5) pressing it against an abutting surface (13) associated to said structure (2), and a release condition, in which the pressure of said tape (5) against said abutting surface (13) decreases and said tape (5) is free to advance along said path of advance;

- at least one printing device (38) operatively associated to said structure (2) to deposit on at least one label (6) borne by said tape (5) a pre-defined quantity of ink, according to a pre-set motif, said printing device (38) comprising at least one support element (39) operatively associated to said structure (2), an inking roller (42) removably engaged to said support element (39) and at least one engagement device (44) operatively and integrally engaged to said inking roller (42) to enable the removable engagement thereof on said support element (39);

- at least one control device (14) operatively associated to said structure (2) and operatively connected to said arresting member (12) and actuating device (11) to bring, at said application area (9), at least one label (6) present on said tape (5), said control device (14) being also operatively connected to said printing device (38), to print said motif on a label (6) and bring said label at said area of application (9), said control device (14) being movable between a first position in which said actuating device (11) is in non operative condition, said printing device (38) is in a rest condition and said arresting member (12) is in condition of arrest and a second position in which said actuating device (11) is in operative condition, said printing device (38) is in a printing condition and said arresting device (12) is in release condition;

- said engaging device (44) comprising a substantially "U" shaped roller holder structure (46), comprising two lateral portions (46a) each provided with a respective seat (47) for the pivotal

engagement of a corresponding longitudinal pivot (48) of said inking roller (42) and a central connecting portion (46b) interposed between said lateral portions (46a);

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**characterised in that** said engaging device (44) further comprises two connecting elastic members (49), each operatively engaged externally to a respective lateral portion (46a) of said roller-holder structure (46), each elastic connecting element (49) being movable between a first position in which it is distanced from the respective lateral portion (46a) of said roller-holder structure (46) and a second position in which it is approached to the respective lateral portion (46a) of said roller-holder structure (46); each elastic connecting element (49) having, at the opposite part from the respective lateral portion (46a) of said roller-holder structure (46), at least one hitching projection (50) adapted to engage at least one respective hitching seat (51) obtained internally in a respective supporting projection (41) of said support element (39) and at least one thrust edge (52) whereby the respective elastic connecting element (49) being moved from the first to the second position, said hitching projection (50) engaging the respective hitching seat (52) when said roller-holder structure (46) is engaged between two supporting projections (41) of said supporting element (39).

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2. A labelling machine as in claim 1, wherein the printing device (28) is distanced from said tape (5) in the resting condition, and operates on a respective label (6) of said tape (5) in the printing condition.
3. A labelling machine as in claim 1 or 2, wherein said engaging device (44) has snap-in engagement means (45) for the engagement of said inking roller (42) to said support element (39).

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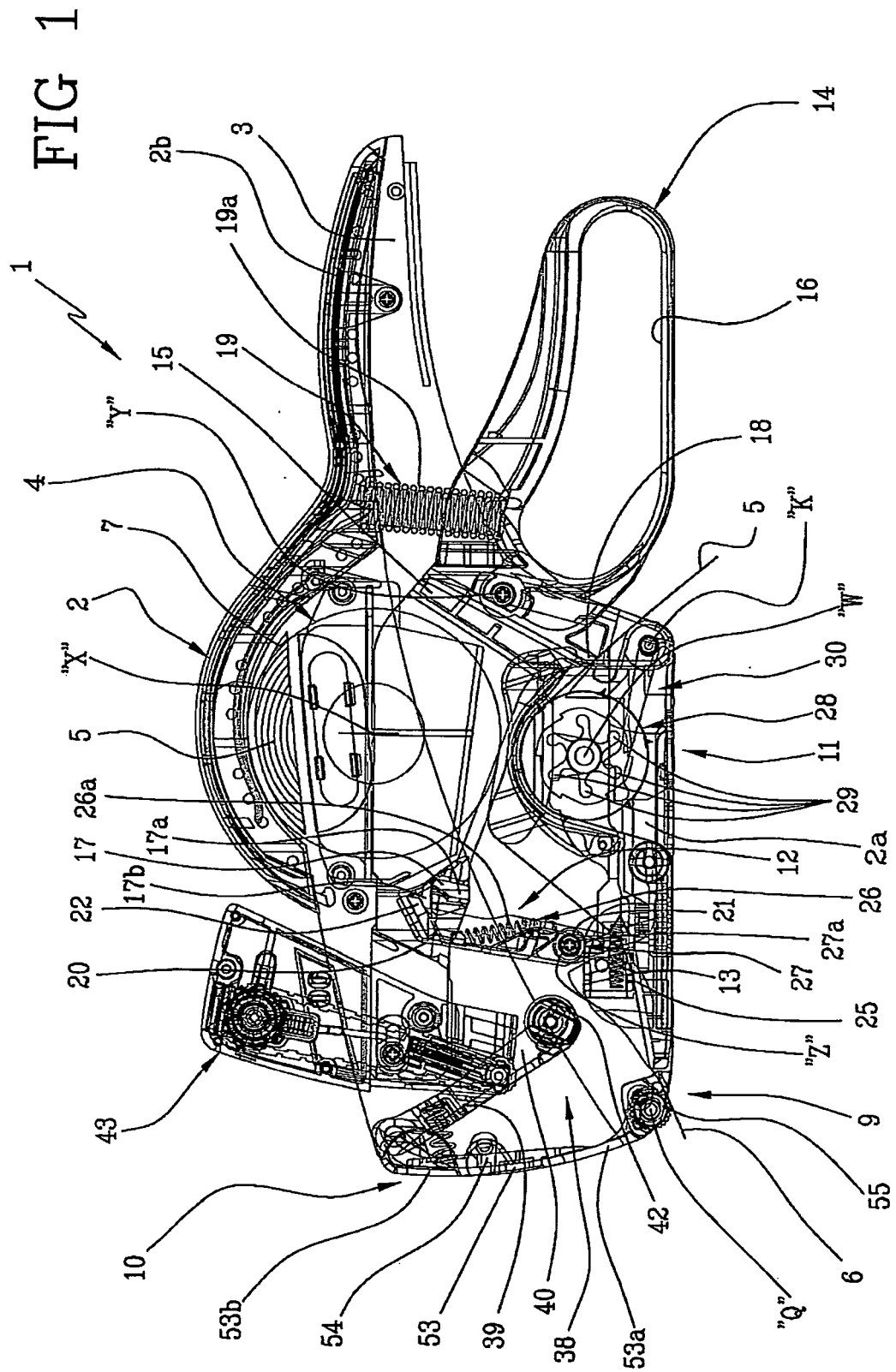
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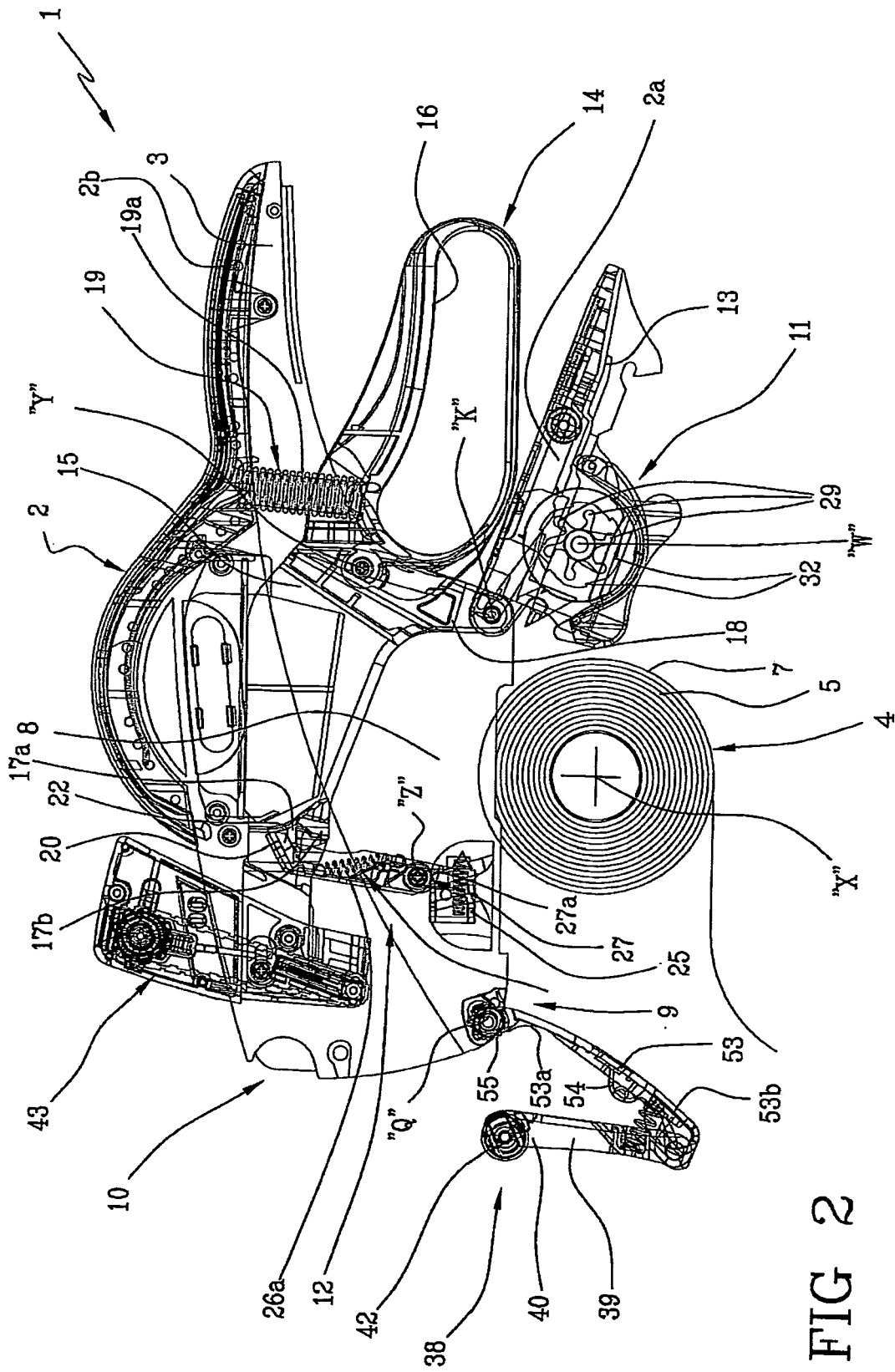


FIG 2

FIG 3

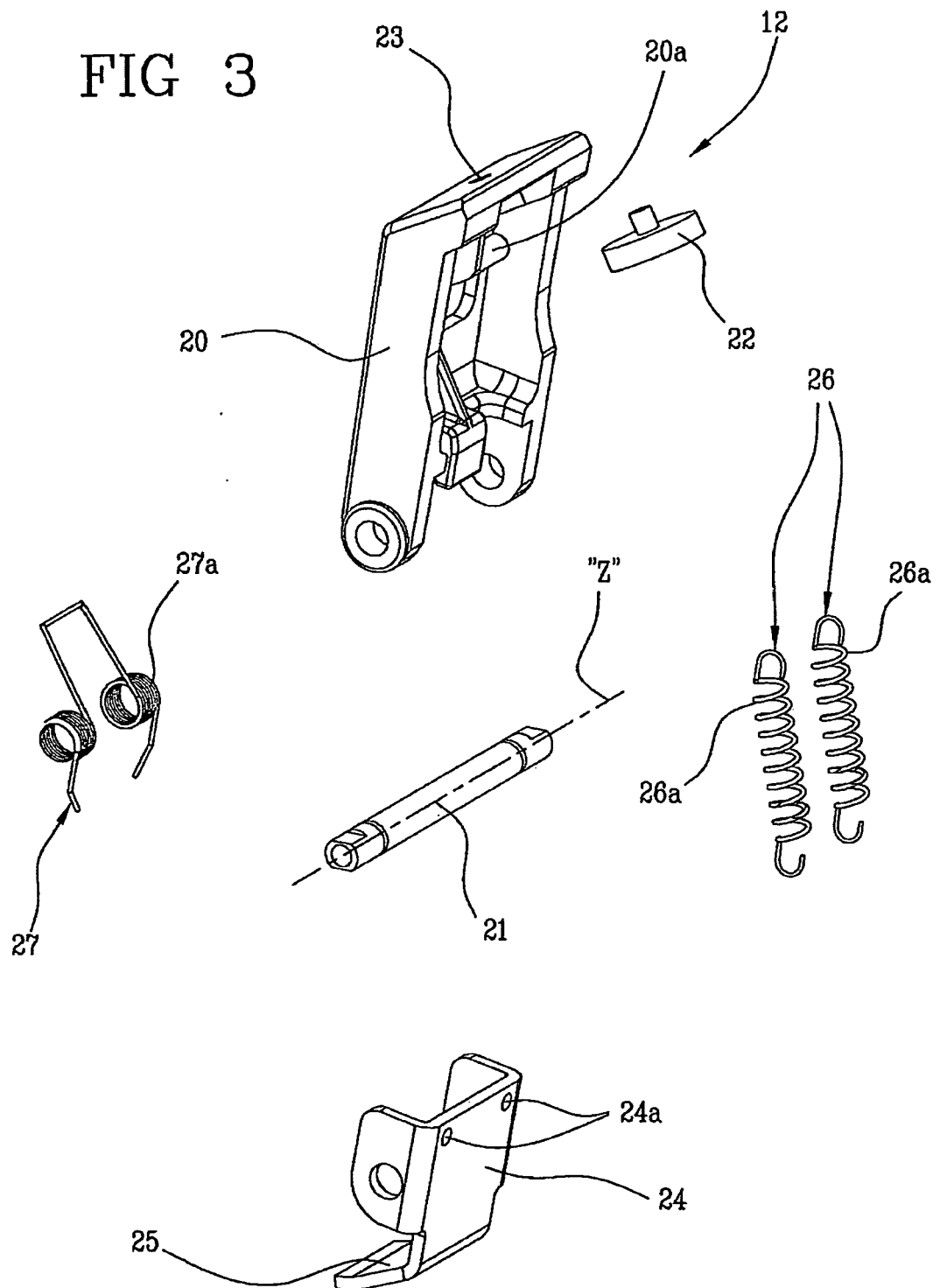


FIG 4

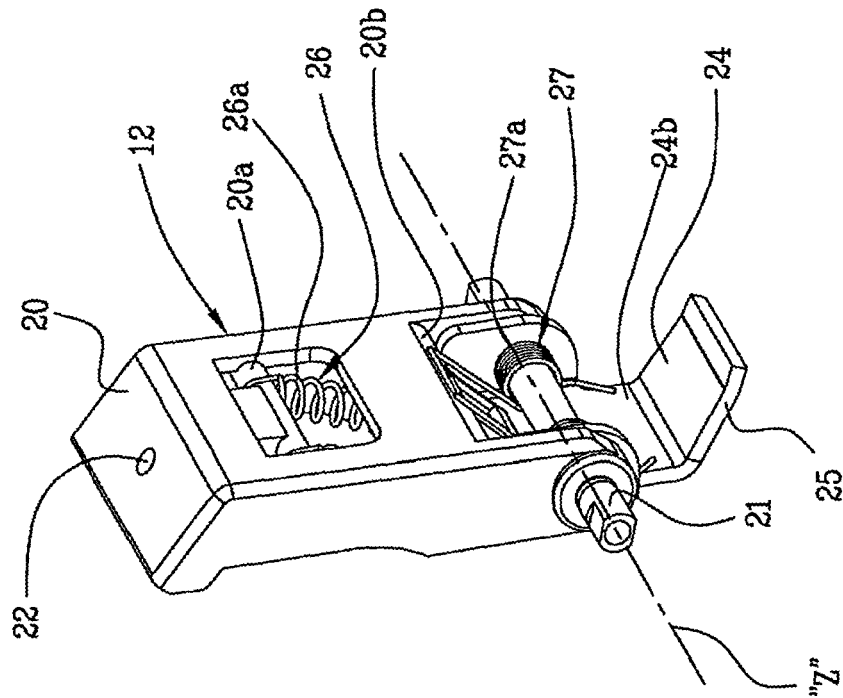
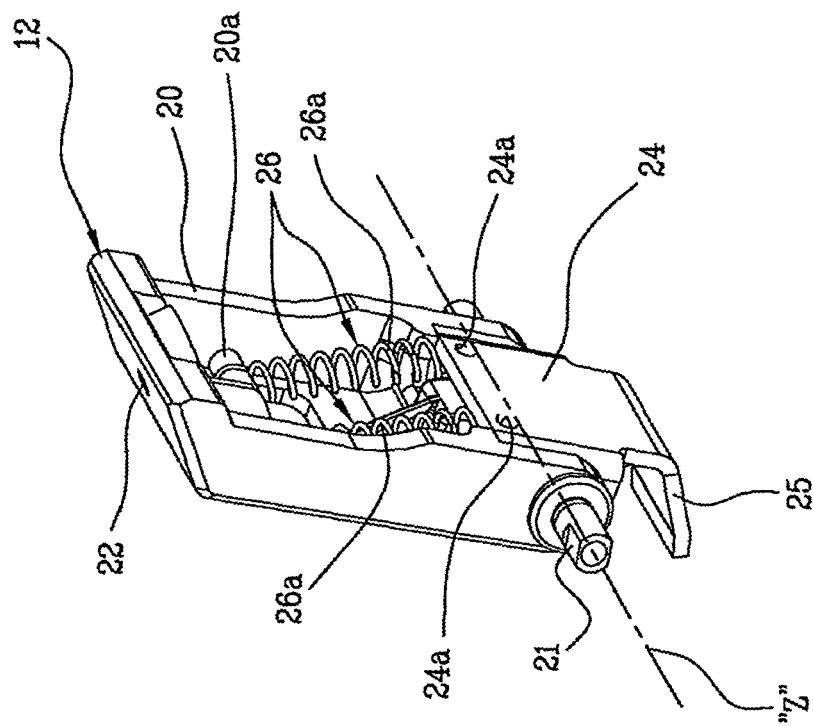


FIG 5



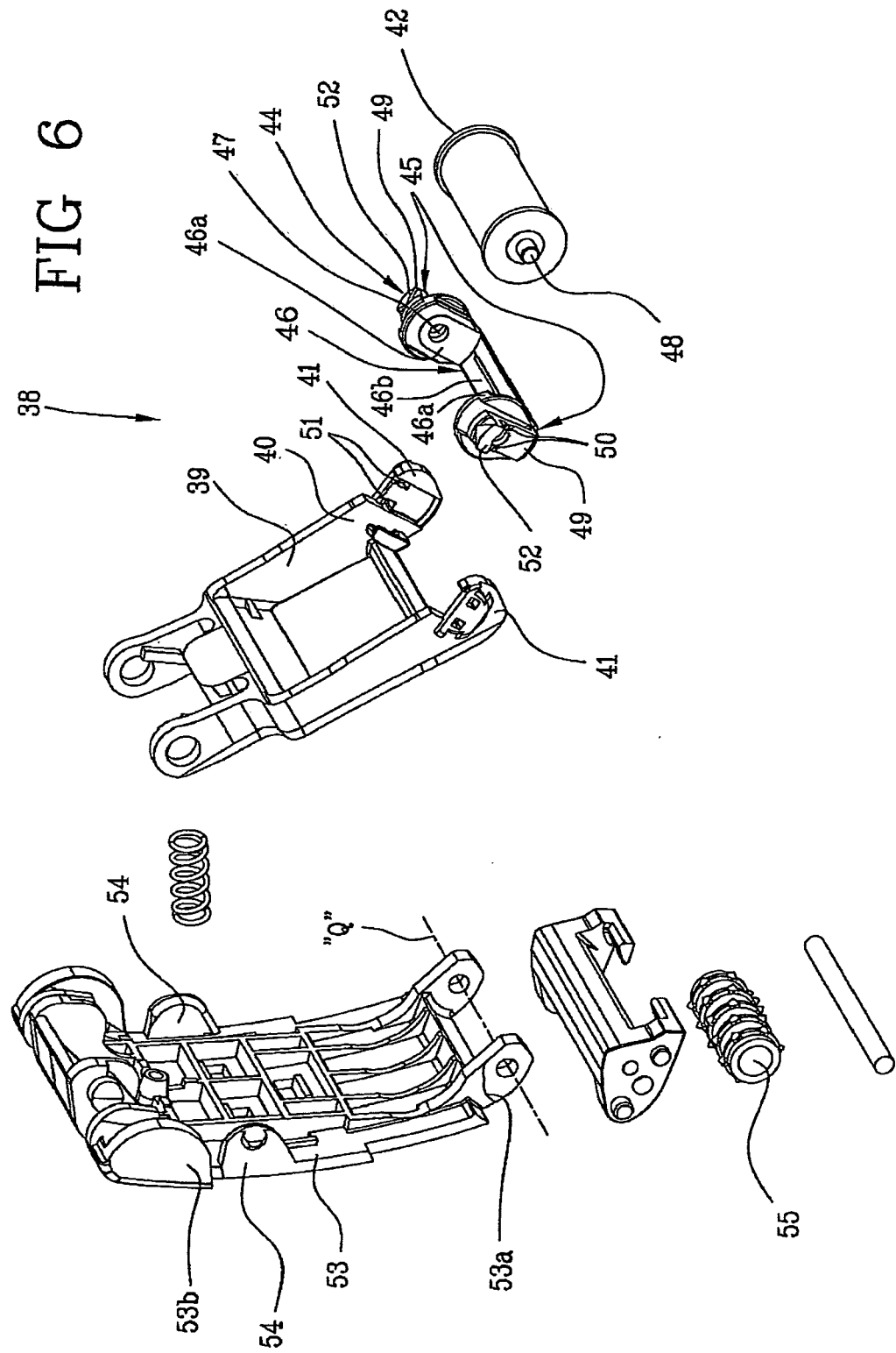


FIG 7

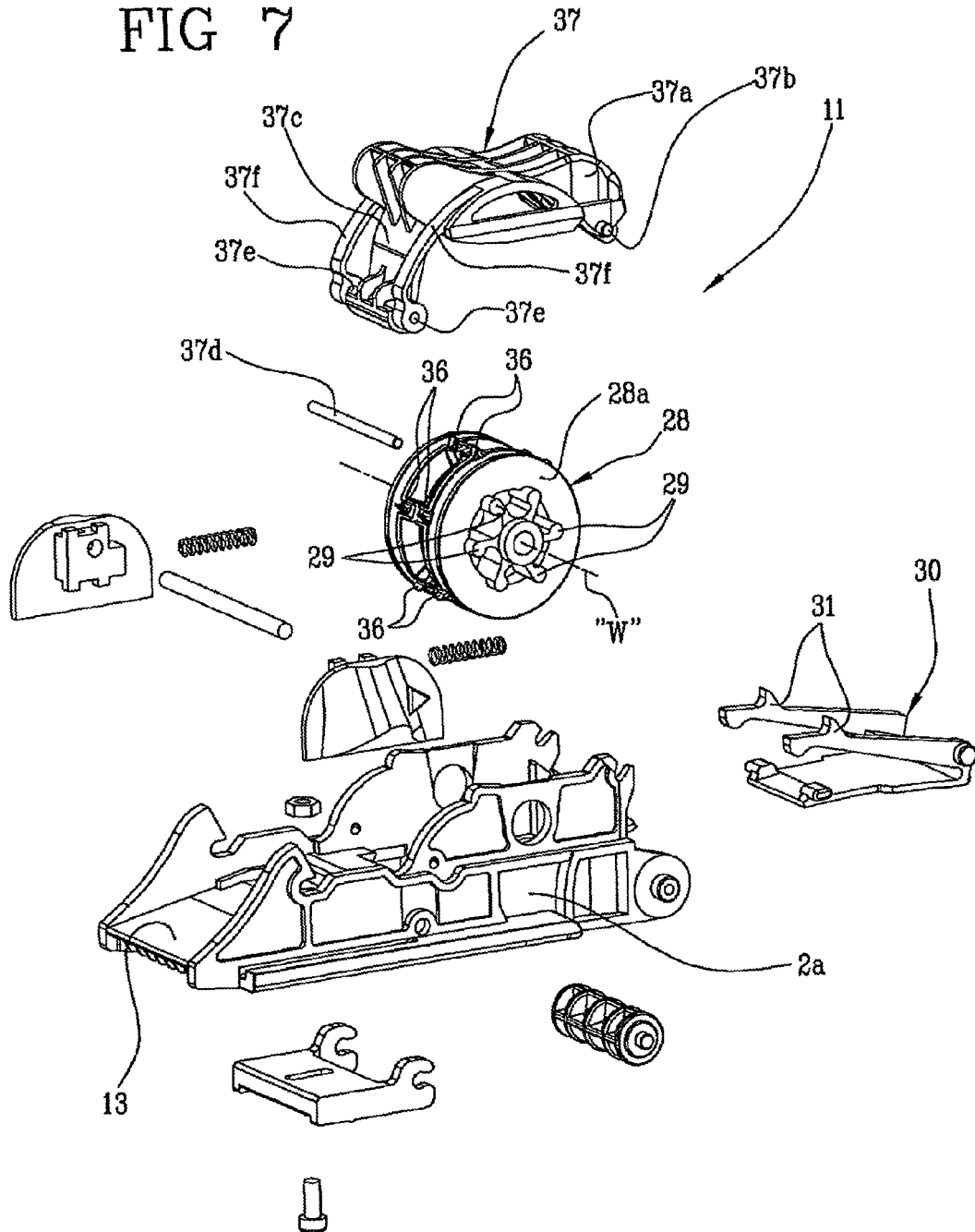
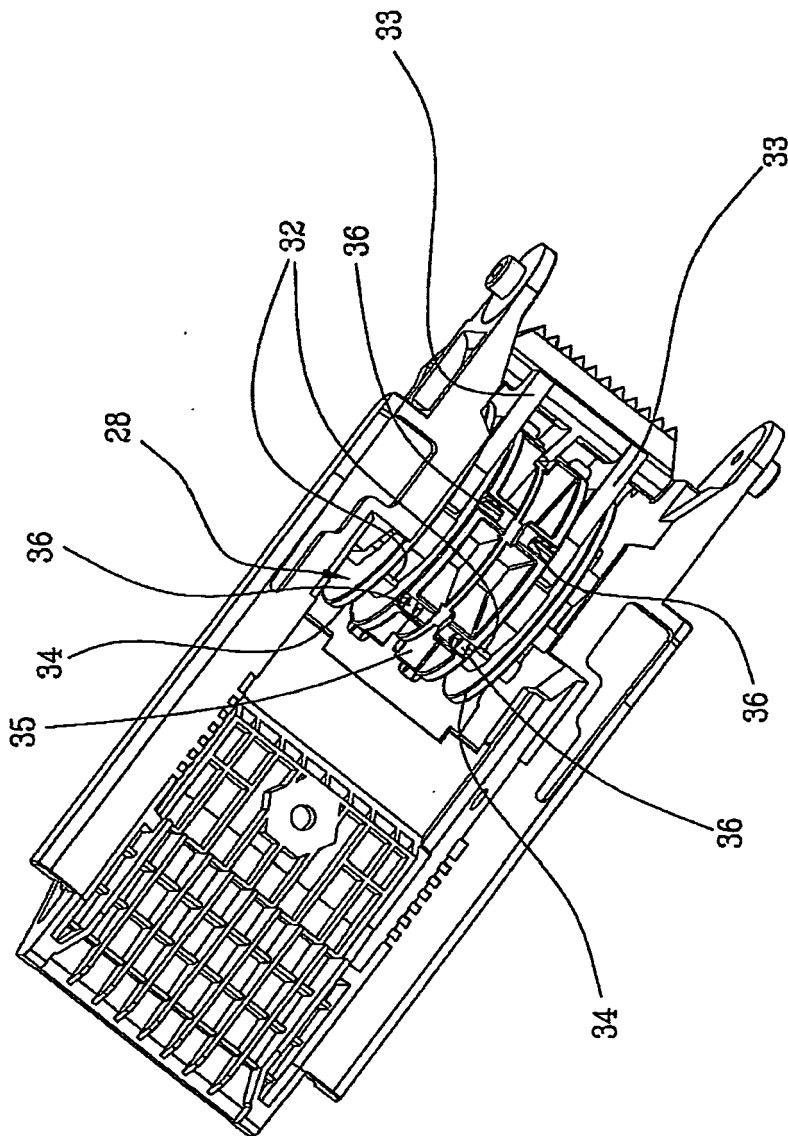


FIG 8





## EUROPEAN SEARCH REPORT

Application Number  
EP 10 00 1796

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                |                                                  |                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|
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