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(71) Applicant: **FIN-MA Ltd.**
725 Market Street
Wilmington, Delaware(US)

(72) Inventor: **Scroccaro, Fulvio**
Via Alta, 136
I-30020 Marcon (Venezia)(IT)

(74) Representative: **Piovesana, Paolo**
Corso del Popolo, 70
I-30172 Venezia-Mestre(IT)

(54) **Dispensing machine for self-adhesive labels.**

(57) The dispensing machine for self-adhesive labels is of the type in which the tape (8) carrying the labels (9) is fed manually stepwise and at the front end of the machine is subjected to a sudden path deviation which causes the progressive separation of the label (9), which advances in the original direction of the tape.

The machine substantially comprises:

- means (29) engaging under friction with the label-carrying tape (8) and tending to cause it to undergo feeding.
- opposition means (39) prevailing over said feed means (29), and
- a member (26') engaging with the rear edge of the most forward label (9) of the tape (8) and cooperating with the feed means (29) in order to overcome the reaction of the opposition means (39) and cause the tape (8) to be fed through a distance equal to the label pitch.

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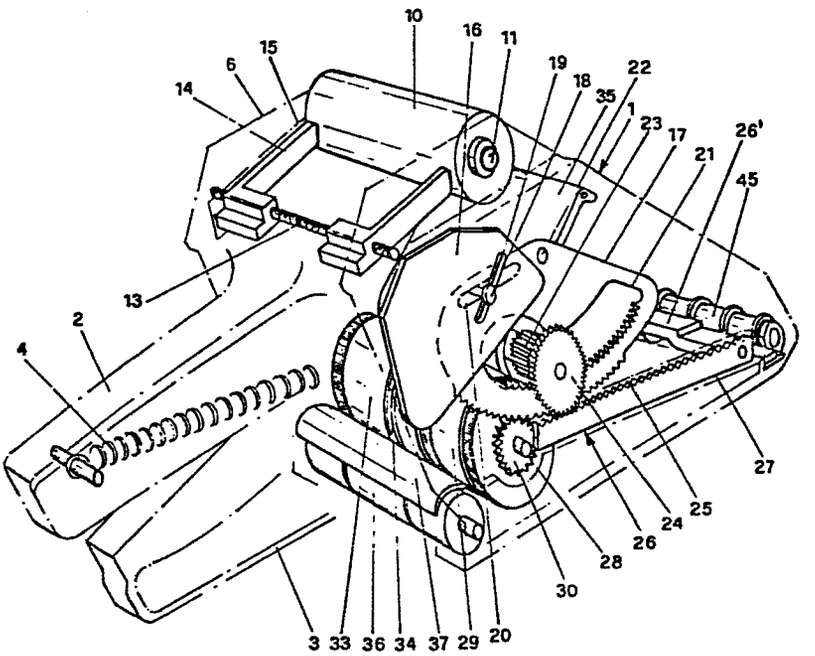
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FIG.1

This invention relates to a manual machine for dispensing self-adhesive labels from tape.

Manual machines are known for detaching self-adhesive labels from a tape of silicon-treated paper or similar material in order to apply them to articles of any kind. The principle on which these machines are based consists of feeding the silicon-treated paper tape carrying applied labels, and then making it undergo a sudden path deviation at the front end of the machine. This is sufficient to cause separation between the paper tape, which is made to leave from the rear end of the machine, and the labels which advance tangentially along the initial direction which the tape took before its sudden path deviation.

Generally, in these known machines the feed of the label-carrying tape is stopped at each cycle before the respective label has completely separated from the silicon-treated paper tape, so that the total separation of the label, which projects frontwards from the dispensing machine, takes place on applying it to the required article.

From the aforesaid, it is evident that the cyclic operation of the machine presupposes that the label-carrying tape is fed at a constant pitch equal to the label pitch, ie

to the distance between the axes of the labels applied to the tape.

This constant feed pitch is currently obtained by providing the paper tape with notches, perforations, slots or similar reference elements, in which a mobile member engages in order to feed said tape through the predetermined distance.

A drawback of this method is that it requires paper tapes formed especially for use with a given machine, and only with that machine, with all the practical and economical drawbacks which result.

A further drawback is that each machine can operate only with the given label pitch, and is therefore not suitable for use with labels of different format.

A further drawback is that the particular feed system for the tape requires high constructional accuracy, in order to prevent operational uncertainties and any possibility of the machine jamming.

An object of the invention is to provide a manual machine for dispensing self-adhesive labels from tape, which can use tapes of any type, ie even tapes without reference elements.

A further object of the invention is to provide a

machine which, if tapes provided with reference elements are used, can operate independently of the type of reference element present.

A further object of the invention is to provide a machine which can be adapted to tape carrying labels of any shape and size.

A further object of the invention is to provide a machine in which the adjustments required for its adaptation to the different types of labels can be done in a very rapid and simple manner, and without requiring any particular care.

These and further objects which will be apparent from the description given hereinafter are attained according to the invention by a dispensing machine for self-adhesive labels, of the type in which the tape carrying the labels is fed manually stepwise and, at the front end of the machine, is subjected to a sudden path deviation which causes the progressive separation of the label, which advances in the original direction of the tape, characterised by comprising:

- means engaging under friction with the label-carrying tape and tending to cause it to undergo feeding,
- opposition means prevailing over said feed means, and

- a member engaging with the rear edge of the most forward label of the tape and cooperating with the feed means in order to overcome the reaction of the opposition means and cause the tape to be fed through a distance equal to the label pitch.

A preferred embodiment of the present invention is described in detail hereinafter with reference to the accompanying drawings in which:

Figure 1 is a transparent perspective view of a dispensing machine according to the invention;

Figure 2 is a longitudinal partial section therethrough, and

Figure 3 is a cross-section therethrough on the broken line III-III of Figure 2.

As can be seen from the figures, the dispensing machine according to the invention comprises substantially a box casing 1 provided with a fixed arm 2, and a mobile arm 3 hinged to the casing 1 and forming with the fixed arm 2 the grip for manual operation by the operator.

The fixed arm 2 and mobile arm 3 are kept spaced-apart when in the rest position by a return spring 4.

The side walls 5,5' of the casing 1 extend upwards into two flanges 6, which define a compartment for housing a

conventional roll 7 of self-adhesive labels. The roll 7 consists of a tape 8 of silicon-treated paper, on which the self-adhesive labels 9 are applied in succession slightly spaced apart from each other. The roll 7 of self-adhesive labels is mounted on a support roller 10 which is elastically snap-engaged with two balls 11 in corresponding recesses 12 provided in the flanges 6.

Between said flanges 6 there is also provided a screw 16 with two opposite-handed threads in which there engage two shoulders 14 which adhere laterally to the roll 7 of labels in order to keep it centered in the machine, and which can be housed, when at their maximum distance apart, in suitable recesses 15 provided on the inside of said flanges 6.

Inside the casing 1 there is housed a feed device for the tape 8. It comprises a plate 16 rigid with the mobile arm 3 and hinged to a further plate 17, which is itself hinged to the wall 5 of the casing 1. The hinge between the plates 16 and 17 is in the form of a slotted link system comprising a screw 18 which is fixed to a slot 19 provided in the plate 16 and which can slide along a slot 20 provided in the plate 17. As it will be apparent hereinafter, the purpose of said slots 19 and 20 is to

enable the machine to be adapted to the different lengths of the labels 9 to be dispensed.

In the plate 17 there is also provided a slot 21 running parallel to the lower edge of said plate and concentric to the hinge pin 22 of the side wall 5. Both the inner edge of the slot 21 and the parallel edge of the plate 17 are toothed. In the inner toothing of the slot 21 there engages a toothed portion of a roller 23 mounted between the two walls 5,5' of the casing 1 and provided with a pair of toothed wheels 24 which engage in two racks 25 rigid with the slide 26. This latter is guided along the walls 5,5' in a substantially longitudinal direction by a pair of rectilinear guides 27 formed in them, and is provided at its front with an elastic tooth 26' resting on the label-carrying tape 8.

A free-wheel device 28 for rotating a friction roller 29 is coupled to the toothed lower edge of the plate 17. More particularly, the toothed lower edge of the plate 17 engages in a pinion 30, coupled by way of the free-wheel device 28 to a shaft 31 which supports the friction roller 29. A disc 32, rotationally rigid with the shaft 31 but axially free thereon, presses the roller 29 against the free-wheel device 28 with a force the intensity of which can

be adjusted from the outside by means of a threaded plug 33 which engages in a threaded portion of the shaft 31.

The outer surface of the roller 28 is also provided with circumferential grooves for housing rubber rings 34 so that they project from the roller surface. The rubber rings 34 are kept in light contact with a fixed front tape guide element 35 and with a backing roller 36, with which a rear tape guide element 37 is associated.

The casing 1 is closed lowerly by a base 38 hinged at its rear to the rotation pivot of the backing roller 36 and provided with conventional catches (not shown in the drawings) for its snap-engagement with the side walls 5,5'. The base 38 is provided with a tape pressing block 39, kept elastically in light contact with the front tape guide element 35 by a small spring 40, the intensity of which can be adjusted from the outside by means of a screw 41.

The base 38 is also provided with a screw 42 with two opposite-handed threads, in which two blocks 43 engage for laterally guiding the tape 8.

In proximity to its front edge, the base 38 comprises a transverse slot 44 for the passage of the tape 8, and in a position slightly forward of the front edge of the base 38 there is provided an exit roller 45 mounted idly

between the two walls 5,5', its purpose as explained hereinafter being to press the labels 9, when almost completely detached from the tape 8, against the articles to which they are to be applied.

The operation of the dispensing machine according to the invention is apparent from the description given hereinafter, in which it is assumed for simplicity that the machine is already adjusted for the particular type of labels to be dispensed.

On this assumption, the roll 7 of labels is mounted on the roller 10, and the tape 8 unwinding from said roll passes initially between the front tape guide element 35 and the friction rolller 29, then between the front tape guide element 35 and the tape pressing block 39, then between the upper surface of the base 38 and the elastic tooth 26' of the slide 26. From this point the silicon-treated paper tape 8 continues its passage without the labels 9 through the slot 44, then between the two guide blocks 43, then between the friction roller 29 and backing roller 36, and finally between the backing roller 36 and upper tape guide element 37, to leave the casing 1 in a position below the mobile arm 3.

When the machine is at rest, the return spring 4

keeps it ie with the mobile arm 3 at its greatest distance from the fixed arm 2 and with the slide 26 in a withdrawn position, in correspondence with which, by virtue of the adjustments previously made, the front edge of the elastic tooth 26' is slightly rearwards of the rear edge of the most forward label 9.

At this point, on operating the machine, ie on forcing the mobile arm 3 towards the fixed arm 2, the plate 16 is made to rotate rigid with the arm 3, with consequent clockwise rotation of the plate 17 by virtue of the articulated linkage between them. On rotating the plate 17 in the direction of the arrow 46 in Figure 2, the roller 23 also rotates to cause the slide 26 to advance, and at the same time to rotate the pinion 33 which drives the free-wheel device 28. Until the elastic tooth 26' of the slide 26 encounters the rear edge of the most forward label 9, the friction roller 29 is unable to drive the silicon-treated paper tape 8, as the friction device is adjusted so as not to prevail over the passive resistance offered to the feed of the label tape. However when the elastic tooth 26' rests against the rear edge of the label 9 and following the further advancement of the slide 26 exerts a tangential thrust on the label tape, the effect of this

thrust is to counterbalance the resistance of the tape to its advancement, and to enable the friction roller 29 to feed the silicon-treated paper tape 8. As a result of the sudden direction change at the slot 44 in the base 38, the advancement of this tape causes the label 9 to become progressively detached from the tape 8 and to emerge tangentially between the front edge of the base 38 and the exit roller 45, whereas the tape 8, now free of labels, advances along the lower surface of the base between the two guide blocks 43.

When the mobile arm 3 terminates its path of travel, the slide 26 is also at its front limit, with the label almost completely separated from the tape 8 and ready to be applied to the desired article, preferably aided by a slight pressure by the exit roller 45.

When the mobile arm 3 is release, the elastic reaction of the spring 4 causes the two plates 16 and 17 to rotate in the opposite direction to the preceding. The connection between the plate 17, roller 23 and slide 26 is of rigid type, and this rotation causes said slide 26 to return to its front limiting position, whereas the connection between the plate 17 and friction roller 29 is by way of the free-wheel device 28, which prevents rotation of

said roller 29 in the opposite direction. As stated, the machine is adjusted in such a manner that when the slide 26 has returned to its rear limiting position, the elastic tooth 26' has passed (backwards) beyond the rear edge of the new lable to be applied, so that subsequent operation of the mobile arm 3 enables the operational cycle to be repeated.

The described operation is correct if the machine has been adjusted for the particular type of label used, ie if the two shoulders 14 and the two blocks 43 of the base 38 are spaced apart to the width of the label tape 8, and if the path of travel of the slide 26 is greater than the label pitch but less than double said pitch.

The machine according to the invention also allows rapid adaptation to labels of different type.

If the label pitch remains constant, but the width of the tape 8 changes, it is necessary only to adjust the two opposite-handed double thread screws 13 and 42 in order to increase or decrease the distance between the shoulders 14 and between the blocks 43 respectively, so as to adapt them to this new width. Obviously, although there is no minimum width of label-carrying tape which can be used, there is a maximum width corresponding to the maximum distance apart at which the shoulders 14 and the blocks 43

can be positioned.

In order to adapt the machine to labels of different length, it is necessary only to move the adjustment screw 18 along the slot 19 of the plate 16.

As the axis of said slot 19 intersects the pin 47 by which the mobile arm 3 and plate 16 are together hinged to the casing 1, and as the axis of the slot 20 intersects the pin 22 by which the plate 17 is hinged to said casing 1, then for equal angular movements of the arm 3 the plate 17 is made to undergo a greater or lesser angular movement by moving the screw 18 along the slot 19, and thus along the slot 20. Moreover as the front limiting position of the slide 26 is fixed and is defined by the slide resting against the exit roller 45, the greater or lesser angular movement of the plate 17 results in the slide 26 assuming a rear limiting position which is more rearward or less rearward. It is therefore sufficient for the operator to adjust this rear limiting position only approximately, so that when in this position the elastic tooth 26' is positioned behind the rear edge of the most forward label.

Having made this very simple adjustment, the machine is ready to operate with the labels of the new length. In fact, on operating the mobile arm 3 the tape 8

will not be fed until the slide 23 has advanced through a small distance, because the friction roller 29 will not be able to overcome the passive resistances which oppose this feed action. However, as soon as the end of the elastic tooth 26' rests against the rear edge of the most forward label 9, the next forward stroke of the slide 26 will cause the entire label-carrying tape to advance.

It is apparent that as the only precaution to be taken during this adjustment is to check that when the slide 26 is in its rear limiting position the elastic tooth 26' is positioned behind the rear edge of the first label, the adjustment operation is sufficiently simple and requires no precision. By virtue of the drive system for the tape 8, any excess in the path of travel of the slide 26 compared with the label pitch is absorbed upstream of the most forward label as an idle stroke of the slide 26.

Finally, to adapt the machine to silicon-treated paper tapes of different characteristics and thus of different feed resistances, two different adjustment systems are possible. One of these consists of adjusting the force with which the block 39 presses the tape 8 against the front tape guide element 35, ie adjusting the preloading of the spring 40 by means of the screw 41. The other adjustment

consists of varying the friction under which the roller 29 is pressed against the free-wheel device 28. To do this, the threaded plug 33 is rotated relative to the roller 29. This operation is facilitated by the presence of a hole 49 in the side wall 5', through which any pointed body can be inserted to lock the plug 33 while the roller 29 is rotated manually.

C L A I M S

1. A dispensing machine for self-adhesive labels, of the type in which the tape (8) carrying the labels (9) is fed manually stepwise and at the front end of the machine is subjected to a sudden path deviation which causes the progressive separation of the label (9), which advances in the original direction of the tape, characterised by comprising:

- means (29) engaging under friction with the label-carrying tape (8) and tending to cause it to undergo feeding,
- opposition means (39) prevailing over said feed means (29), and
- a member (26') engaging with the rear edge of the most forward label (9) of the tape (8) and cooperating with the feed means (29) in order to overcome the reaction of the opposition means (39) and cause the tape (8) to be fed through a distance equal to the label pitch.

2. A machine as claimed in claim 1, characterised by comprising, downstream of the zone in which the tape (8) undergoes sudden path deviation, a roller (29) adhering by its lateral surface to said tape (8) and engaged, by means of a friction member (32), with a free-wheel device (28)

rotated by the operator as a result of operating the machine grip (3).

3. A machine as claimed in claim 1, characterised in that the friction member (32) is provided with adjustment means (33).

4. A machine as claimed in claims 2 and 3, characterised in that the free-wheel device (28) is coupled to the support shaft (31) for the roller (29), which is made to adhere to said free-wheel device (28) by means of a disc (32) which is rotationally rigid with said shaft (31) but axially free thereon, said disc (32) being urged axially against said roller (29) with a force of adjustable intensity.

5. A machine as claimed in claim 4, characterised in that the end of the support shaft (31) for the roller (29) which is distant from the free-wheel device (28) is threaded and is engaged by a screw (33) which clamps said roller (29) between said disc (32) and said free-wheel device (28) with adjustable intensity.

6. A machine as claimed in claim 5, characterised in that the adjustment screw (33) can be operated from the outside through a hole (49) provided in the side wall (5').

7. A machine as claimed in claim 2, characterised in

that the lateral surface of the roller (29) comprises circumferential grooves housing rubber rings (34) which adhere to the label-carrying tape (8).

8. A machine as claimed in claim 2, characterised by comprising an idle backing roller (38) downstream of the roller (29) and in contact therewith.

9. A machine as claimed in claim 1, characterised by comprising at least one block (39) which presses the label-carrying tape (8) against a fixed tape guide element (35).

10. A machine as claimed in claim 9, characterised in that the block (39) is provided with a spring (40) preloaded by means of an adjustment screw (41).

11. A machine as claimed in claim 1, characterised by comprising a slide (26) mobile in a direction substantially parallel to a portion of the label-carrying tape (8) upstream of the zone of sudden deviation between a front position, in which the most forward label of the tape has been almost completely detached from the tape by the member (26') which engages the rear edge of the labels (9), and a rear position in which said engagement member (26') is situated upstream of the rear edge of said most forward label, but downstream of the rear edge of the next label.

12. A machine as claimed in claim 11, characterised in that the rear limiting position of the slide (26) is adjustable.

13. A machine as claimed in claims 1 and 11, characterised in that there is associated with the slide (26) a rack member (25) operated by a pinion (24) which is rotated by the operator as a result of the operation of the machine grip (3).

14. A machine as claimed in claims 2 and 13, characterised in that the free-wheel device (28) and pinion (24) are linked to the machine grip (3) by way of a slotted link system (16,17) which allows the angular movement undergone by said free-wheel device (28) and by said pinion (24) to be varied for equal angular movements of the grip (3).

15. A machine as claimed in claim 1, characterised by comprising lateral guides (14,43) for the tape (8), which are operable simultaneously in opposing direction in order to be positioned in conformity with different widths of said tape.

16. A machine as claimed in claim 15, characterised in that the guides (14,43) are mounted in pairs on screws (13,42) which each have two opposite-handed threads.

FIG.1

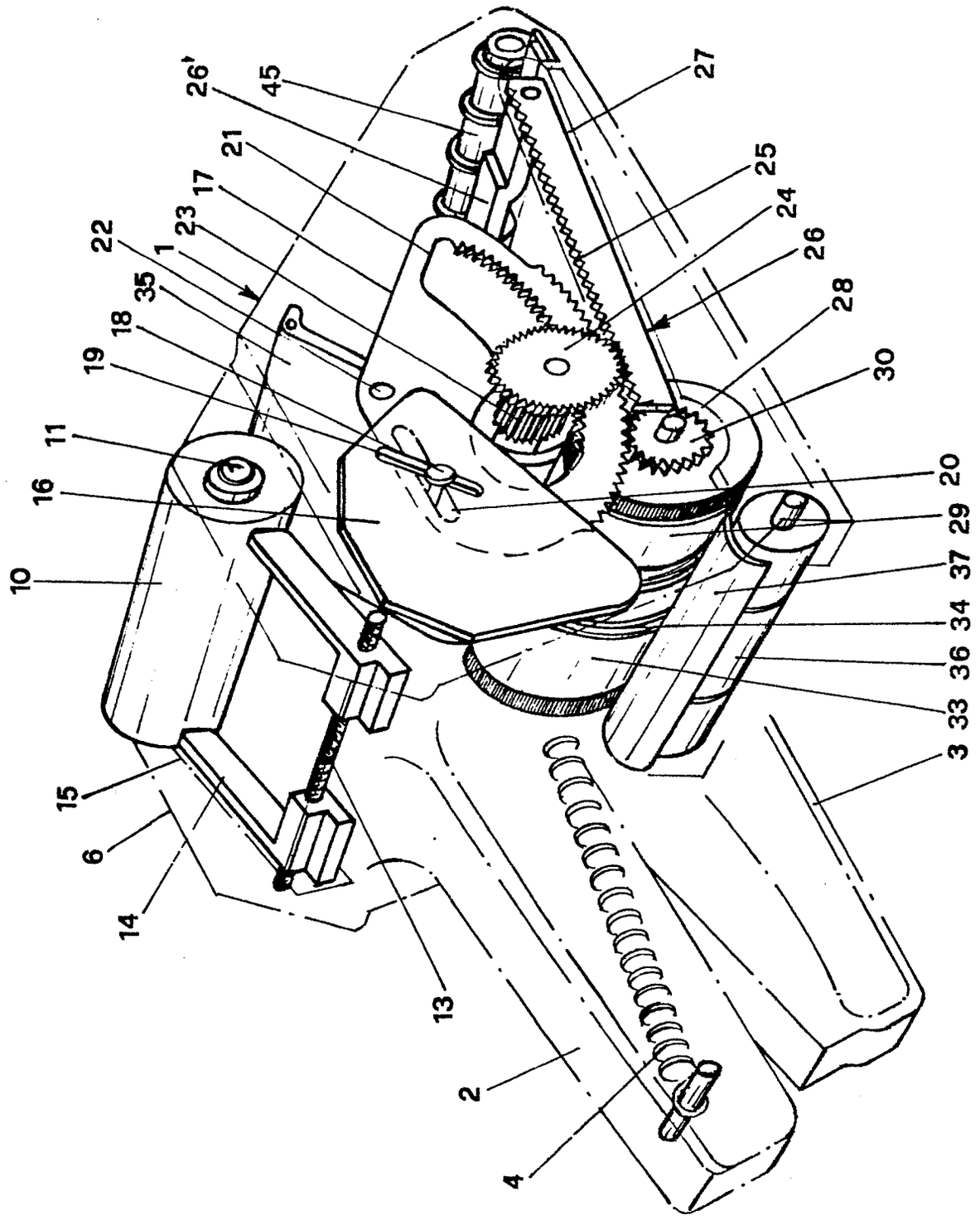
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FIG. 3

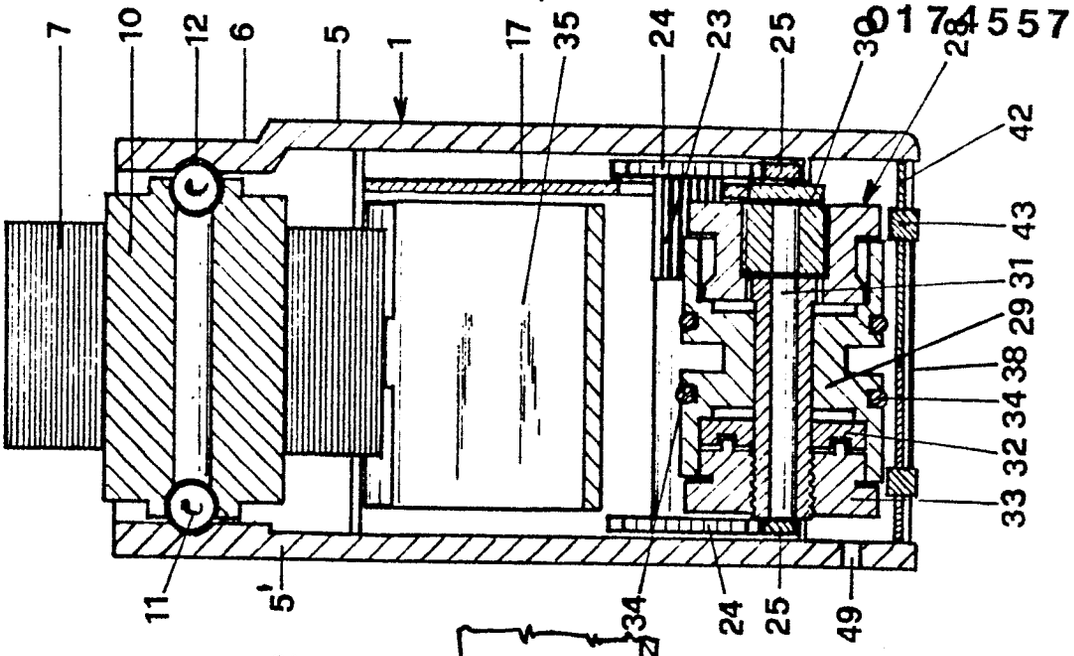
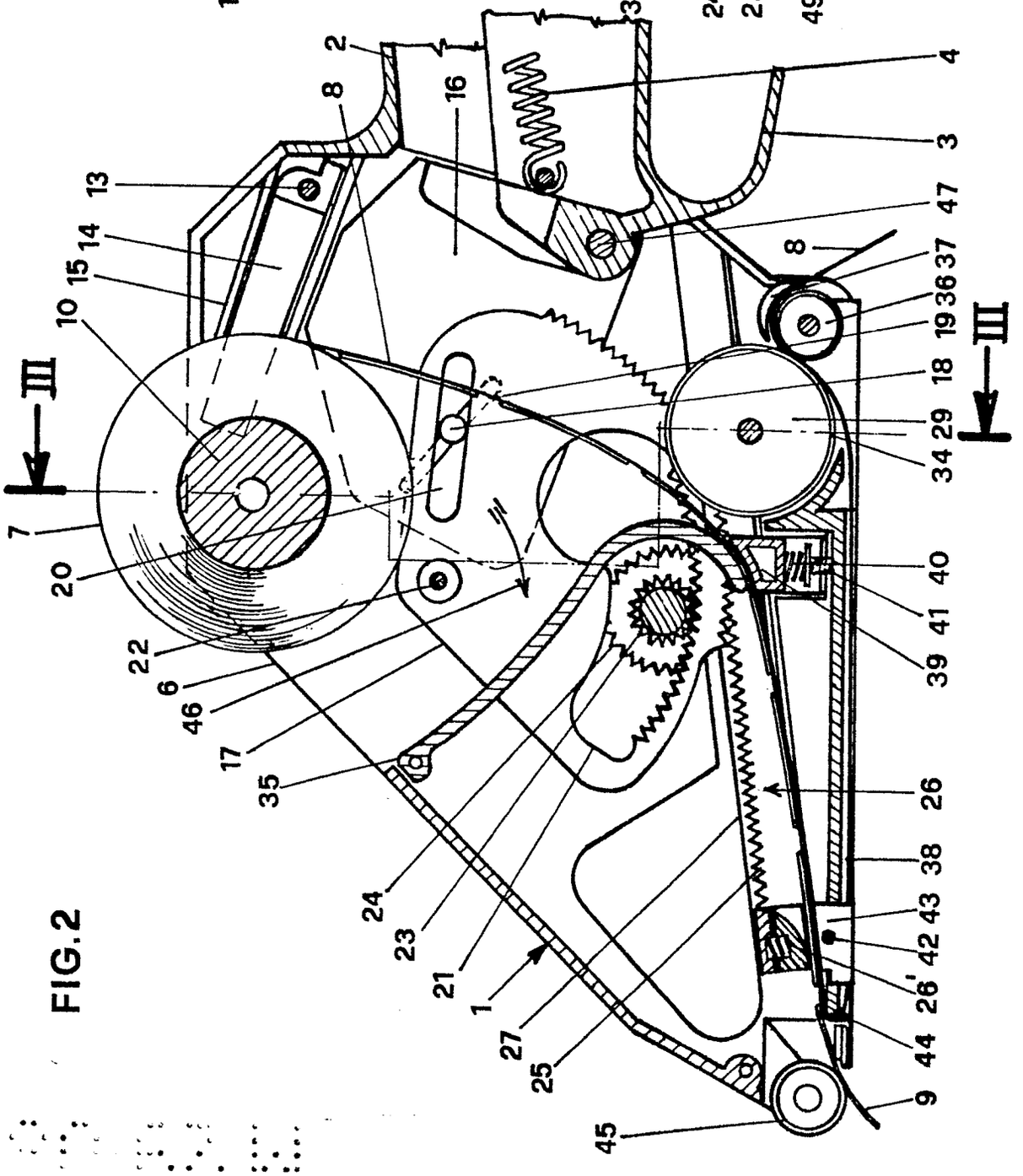


FIG. 2



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EUROPEAN SEARCH REPORT

Application number
EP 85 11 0865

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 4)
Y	EP-A-0 016 849 (METO INTERNATIONAL GmbH) * Claims 1-3; figures 1-3 *	1,2,7-9	B 65 C 9/42 B 65 C 11/00
Y	US-A-3 653 539 (STAGEBERG) * Column 2, line 74 - column 3, line 34; figures 1-4 *	1,2,7-9	
Y	US-A-4 274 906 (CLAR) * Column 3, lines 62-68; figure 4 *	7	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	19-11-1985	VROMMAN L.E.S.

CATEGORY OF CITED DOCUMENTS

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