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⑤④ **Label positioning mechanism for printing machine.**

⑤⑦ A label positioning mechanism for use with a printing machine which is operative to print one by one the labels. The label positioning mechanism includes a feed wheel (9) which is mounted rotatably in the body of the printing machine and formed on its circumference with such a label advancing surface (35) as is engageable with the label strip (8) for advancing the same in a preset direction. Further inclusive is a label positioning member (29) which is connected pivotally to the machine body such that it is rotatable to and from the label advancing surface of the feed wheel. An arm mechanism (25, 29) has its one end fixed to an operating shaft (18), which is mounted rotatably in the machine body, and its other end connected pivotally to the label positioning member so that the operating force of the operating shaft may be transmitted to the label positioning member when the operating shaft is actuated. Biasing means (38) is used to urge the label positioning member to the feed wheel.

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10 LABEL POSITIONING MECHANISM FOR PRINTING MACHINE

BACKGROUND OF THE INVENTION

15 Field of the Invention

The present invention relates to a label printing machine, and more particularly to a label positioning mechanism for use with the label printing machine.

20 Description of the Prior Art

Generally speaking, in a printing machine such as a label printing and applying machine, in order to feed a continuous strip of labels onto a printing platen, a feed wheel is turned while having its pawls engaging
25 with the slits which are formed in the continuous label strip. In order to ensure the engagement and accordingly the feed, therefore, the label strip has to be brought into contact with the feed wheel.

30 For this purpose, the conventional label positioning mechanism has such a label positioning member mounted in the body of the printing machine as can be brought to and from the label advancing circumference of the feed wheel. However, the prior art has failed to provide a
35 label positioning mechanism which can bring the continuous label strip into contact with the feed wheel in a reliable manner even with a simplified construction and

1 and which can accomplish the operations of loading and
unloading the label strip onto and from the feed wheel.

SUMMARY OF THE INVENTION

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It is, therefore, an object of the present invention to provide a label positioning mechanism for use with a printing machine, which is free from the drawbacks concomitant with the prior art.

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Another but major object of the present invention is to provide a label positioning mechanism of the above type, in which a label positioning member can be brought to and from the label advancing surface of a feed wheel by the actuation of an operating shaft and in which the label positioning member is urged to the label advancing surface of the feed wheel by the biasing force of biasing means so that the label strip can be pushed onto the feed wheel without any fail to ensure its feed and so that the loading and unloading operations of the label strip onto and from the feed wheel can be carried out easily and smoothly, while simplifying the overall constructure of the label printing mechanism.

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According to a major feature of the present invention, there is provided a label positioning mechanism for use with a printing machine, which is operative to print one by one the labels removably adhered in series to a strip of backing paper, said label positioning mechanism comprising: a feed wheel mounted rotatably in the body of said printing machine and formed on its circumference with a label advancing surface which is engageable with the label strip for advancing the same in a preset direction; a label positioning member connected pivotally to the body of said printing machine such that it is rotatable between a first position, where it is apart from the label advancing surface of said feed wheel

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1 thereby to form an opening inbetween, and a second
position, where it is close to the same thereby to leave
a clearance having a spacing substantially equal to the
thickness of said label strip; an operating shaft mounted
5 rotatably in the body of said printing machine; an arm
mechanism having its one end fixed to said operating
shaft and its other end connected pivotally to said
label positioning member thereby to transmit the operat-
ing force of said operating shaft to said label position-
10 ing member when the former is actuated; and biasing means
for urging said label positioning member to the second-
named position through said arm mechanism.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Other objects and advantages of the present invention
will become apparent from the following description taken
in conjunction with the accompanying drawings, in which:
Fig. 1 is a simplified side elevation of the label
20 printing machine such as a label printing and apply-
ing machine of portable type, in which the label
positioning mechanism according to the present in-
vention is used, with the label positioning member
being apart from the feed wheel;
25 Fig. 2 is also a simplified side elevation of the
label printing machine with the label positioning
member being positioned close to the label advancing
circumference of the feed wheel; and
Fig. 3 is an enlarged perspective view showing the
30 essential components of the label positioning
mechanism partially in an exploded manner.

DESCRIPTION OF THE PREFERRED EMBODIMENT

35 The label positioning mechanism according to the present
invention will now be described with reference to Figs.
1 to 3.

1 Indicated generally at reference numeral 1 is the body
of a printing machine such as a hand labeler, with which
the label positioning mechanism is to be used. The
machine body 1 is equipped with a grip 2, a hand lever 3,
5 a printing head 4 and a not-shown printing platen, all of
which are required for the printing operations. The
machine body 1 thus constructed has its upper center
portion formed integrally with a label holder side plate
6, which in turn is equipped at its center with a core
10 retainer 7. There is attached removably and rotatably
to the core retainer 7 a continuous strip of labels 8
which is rolled on a not-shown core. The continuous
label strip 8 is composed of a number of labels which
are removably adhered to the surface of a strip of back-
15 ing paper. This backing paper strip is formed at its
preset position with not-shown slits, which are sized
to be detachably retained by the pawls 10 of a later-
described feed roller 9. On the other hand, the label
holder side plate 6 is equipped at its rear end (or at
20 the righthand side of Fig. 1) with a guide roller 11, by
which the leading end of the continuous label strip 8 is
guided while being retained thereon.

There are located at the upper portion of the machine
25 body 1 a pair of upper label inlet members 12 which are
made integral therewith while leaving a preset clearance
therefrom in the widthwise direction. Each of the upper
label inlet members 12 has its upper end positioned in
the vicinity of the guide roller 11 and its lower end
30 positioned in the vicinity of the upper end portion of a
guide plate 13, which will be described later. The
intermediate portion of each of the upper label inlet
members 12 between the two ends thereof is gently curved
along the outer surface of the continuous label strip 8.
35 There are located below the upper label inlet members 12
a pair of lower label inlet members 14 which are also
made integral with the machine body 1 such that they are

1 curved along the upper members 12. Thus, there is
formed a clearance 15 of preset spacing between the
upper surfaces of the lower members 14 and the lower
surfaces of the upper members 12. It should be noted
5 here that the upper end portions of the both label inlet
members 12 and 14 are curved to leave each other so that
they can receive the leading end of the continuous label
strip 8 without any difficulty.

10 The afore-mentioned guide plate 13 is made to have a
generally rectangular shape and to depend from the front
(which is located in the lefthand side of Fig. 1) of the
lower end portions of the lower label inlet members 14.
There is located at the back of the guide plate 13 a
15 pressure tongue 16 which is hinged to depend from the
lower end portions of the lower label inlet members 14.
The pressure tongue 16 thus hinged is always biased by a
torsion spring 17 in the direction to be brought into
contact with the back of the guide plate 13.
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There is located in front of the guide plate 13 an
operating shaft 18 of rectangular section, which is
rotatably mounted to the machine body 1 by means of two
rollers 18a. As seen from Fig. 3, a lock lever 19 is
25 formed with a rectangular hole so that it is fixed
therethrough to one end portion of the operating shaft
18. The lock lever 19 is made to have a cylindrical
main portion 20 formed in its outer circumference with
an engagement notch 21, which is made into and out of
30 engagement, by the raising and laying operations of the
lock lever 19, with the engagement projection 23 of such
an L-shaped engagement member 22 as is fixed to the
outer side of the machine body 1. It should be noted
35 here that the upright portion 22a of the engagement
member 22 is made of an elastic material so as to ensure
and facilitate the engagement and disengagement between
the engagement notch and projection 21 and 23.

1 There are fixed to the operating shaft 18 a pair of
operating arms 25, which are juxtaposed at a preset
spacing while being connected by means of a bridge
member 24, at their end portions 25a through their
5 rectangular holes 26. The other end portions 25b of
the operating arms 25 are arranged before and below the
operating shaft 18. A pair of connecting arms 27 are
pivotally connected at their one ends 27a to the other
end portions 25b of the operating arms 25, respectively.
10 The arms 27 thus connected are made to depend from the
other end portions 25b of the operating arms 25 and to
have their other ends 27b pivotally connected to the one
end 29a of a label positioning member 29 through a long
pin 28. It should be noted here that there are mounted
15 three guide rollers 30 equidistantly and rotatably on
that long pin 28 so as to smoothen the feed of the con-
tinuous label strip 8.

The afore-mentioned label positioning member 29 is made
20 of a synthetic resin or the like such that it is curved
along the outer circumference of the feed wheel 9, which
will be described later in detail. The label position-
ing member 29 is connected at its other end 29b to the
machine body 1 pivotally by a preset angle by means of a
25 shaft 31. There is mounted on the lower surface of the
label positioning member 29 a label holding member 32
which has its one end 32a retained on the one end 29a of
the member 29 and its other end 32b retained on the
other end 29b of the same. The center portion of the
30 label holding member 32 is exposed to the outside
through an aperture 33 which is formed in the label
positioning member 29. A pair of widthwise regulating
side plates 34 are formed to depend from the both side
edges of the label positioning member 29 so as to
35 regulate the widthwise play of the continuous label
strip 8.

1 The label positioning member 29 thus constructed is
brought to approach and leave the feed wheel 9 of
cylindrical shape through the continuous label strip 8.
The feed wheel 9 is mounted to the machine body 1 by
5 means of a shaft 36 such that it can be turned a preset
pitch by the manual squeezing action of the hand lever 3
of the machine body 1. The outer circumference of the
feed roller 9 acts as a label advancing surface which is
formed equidistantly with a number of the pawls 10 in the
10 circumferential direction of the feed wheel 9.

On the other hand, a pair of torsion springs 38 are
wound on the center portion of the afore-mentioned
operating shaft 18 such that they have their one ends 38a
15 retained on the upper edges of the operating arms 25 and
their other ends 38b retained on the upper edge of the
bridge member 24. As a result, the both operating arms
25 are always biased to rotate counter-clockwise about
the operating shaft 18, as viewed in Fig. 2. Thus, the
20 label positioning member 29 is biased to rotate clockwise
about the shaft 31 by the actions of the operating arms
25 so that it is pushed onto the label advancing surface
35 of the feed wheel 9.

25 Now, the loading and unloading operations of the con-
tinuous label strip 8 onto and from the label position-
ing mechanism thus far described will be described here-
inafter. The description is first made upon the case,
in which the label strip 8 is to be loaded onto the
30 label positioning mechanism. Fig. 1 shows the condi-
tion, under which the lock lever 19 is at its raised
position so that its engagement notch 21 is in engage-
ment with the engagement projection 23 of the engagement
member 22. As a result, the operating arms 25 have
35 their other ends 25b held before and above their one
ends 25a, and the label positioning member 29 has its
one end 29a held at the upper limit of its rotations so

1 that it establishes an open space together with the label
advancing surface 35 of the feed wheel 9.

5 Under this condition, the continuous label strip 8, which
is held on the core retainer 7, is unrolled therefrom so
that its leading end is inserted by way of the guide
roller 11 into the clearance 15 between the upper and
lower label inlet members 12 and 14 and further advanced
10 along these members 12 and 14. The label strip 8 thus
advanced brings its leading end into abutment against
the rear surface of the guide plate 13, where it turns
its advancing direction so that its leading end can pro-
ceed between the guide plate 13 and the pressure tongue
16. Since, in this instance, the pressure tongue 16 is
15 urged forward by the action of the torsion spring 17,
the leading end of the label strip 8 is guided, while
running on the upper surface of the pressure tongue 16,
into the opening which is formed between the label
positioning member 29 and the feed wheel 9. Then, the
20 label strip 8 is advanced along the label advancing
surface 35 of the feed wheel 9 until it is fed to the
outside from between that surface 35 and the other end
29b of the label positioning member 29.

25 After that, the afore-mentioned lock lever 19 is laid
down so as to release the engagement between the notch
21 and the projection 23. Then, the operating shaft 18
is turned counter-clockwise, as viewed in Fig. 1, and
the operating arms 25 are accordingly turned counter-
30 clockwise about the operating shaft 18. It should be
noted here that the rotations of the operating arms 25
can take place promptly and smoothly because the biasing
forces of the torsion springs 38 act in the direction to
35 promote the rotations of the operating arms 25.

In this meanwhile, the connecting arms 27 are moved
downward in accordance with the rotations of the operat-

1 ing arms 25 so that the label positioning member 29 is
turned clockwise, as viewed in Fig. 1, about the shaft
31 until it pushes the continuous label strip 8 in
position onto the label advancing surface 35 of the feed
5 wheel 9, as can be seen from Figs. 2 and 3. It should
be noted here that the pushing operation of the label
positioning member 29 can be accomplished reliably
because the biasing forces of the torsion springs 38 act
to bias the connecting arms 27 downwardly, as viewed in
10 Fig. 2, through the operating arms 25.

If, under such condition, the hand lever 3 or the like
of the machine body 1 is actuated or squeezed, the feed
wheel 9 is turned a preset pitch so that the continuous
15 label strip 8 can be fed in a desired direction by the
actions of the pawls 10 on the feed wheel 9.

Now, the description will be made upon the case, in which
the continuous label strip 8 is to be unloaded from the
20 feed wheel 9. When the lock lever 19 is raised from its
laid position of Fig. 2, the operating shaft 18 is
turned clockwise, as viewed in the same Figure. The
operating arms 25 are accordingly turned clockwise about
the operating shaft 18 so that their other ends 25b are
25 held at the upper limit of their rotations by the engage-
ment between the notch 21 of the lock lever 19 and the
projection 23 of the engagement member 22.

30 During the rotations of the operating arms 25, the
connecting arms 27 are pulled upward so that the label
positioning member 29 is turned counter-clockwise, as
viewed in Fig. 2, about the shaft 31. As a result, the
afore-mentioned opening is formed again between that
35 member 29 and the feed wheel 9, thus restoring the
initial condition of Fig. 1.

1 After that, if that portion of the continuous label strip
8 in the vicinity of the upper ends of the upper and
lower label inlet members 12 and 14 is pulled upward, the
label strip 8 as a whole can be taken out of the machine
5 body 1 by way of that opening, the pressure tongue 16,
the guide plate 13 and the clearance 15 between the inlet
members 12 and 14 in the order recited.

10 As has been described hereinbefore, the following points
will be appreciated as the advantages of the label
positioning mechanism according to the present invention.

15 First of all, since the label positioning member is
urged toward the feed wheel by the biasing forces of the
elastic members, the continuous label strip never fails
to be pushed onto the feed wheel so that it can be fed
without fail in accordance with the rotations of the
feed wheel.

20 Since, moreover, the label positioning member is made
capable of approaching and leaving the label advancing
surface of the feed wheel, the loading and unloading
operations of the label strip onto and from the feed
wheel can be accomplished easily and promptly. This
25 advantage can be reflected by the case, in which the
labels are peeled off from their backing strip and
adhered to the feed wheel or the like. Even in this
case, those labels can be removed without any difficulty.

30 It should be appreciated as a further advantage that the
bringing operations of the label positioning member to
and from the feed wheel can be carried out easily and
promptly simply by actuating the operating shaft.

35 Since, still moreover, the pushing operation of the
label positioning member onto the feed wheel is accom-
plished by the biasing forces of the elastic members,

1 it can take place smoothly and promptly.

The major components of the label positioning mechanism
of the present invention are five, namely, the label
5 positioning member, the arm mechanism, the operating
shaft, the elastic member and the feed wheel. Thus,
the number of parts required is relatively small for the
label positioning mechanism of this kind, while simplify-
ing the construction, so that the label positioning
10 mechanism of the invention can suit itself for mass
production.

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1 Claims:

1. A label positioning mechanism for use with a printing machine which is operative to print one by one the
5 labels, said label positioning mechanism comprising:
a feed wheel mounted rotatably in the body of said
printing machine and formed on its circumference with a
label advancing surface which is engageable with the
10 label strip for advancing the same in a preset direction;
a label positioning member connected pivotally to the
body of said printing machine such that it is rotatable
between a first position, where it is apart from the
label advancing surface of said feed wheel thereby to
15 form an opening inbetween, and a second position, where
it is close to the same thereby to leave a clearance
having a spacing substantially equal to the thickness of
said label strip;
an operating shaft mounted rotatably in the body of said
printing machine;
20 an arm mechanism having its one end fixed to said operating
shaft and its other end connected pivotally to said
label positioning member thereby to transmit the operating
force of said operating shaft to said label positioning
25 member when the former is actuated; and
biasing means for urging said label positioning member
to the second-named position.

2. A label positioning mechanism according to claim 1,
30 wherein said arm mechanism includes a pair of operating
arms having their one ends fixed to said operating shaft,
a bridge member connecting said operating arms, and a
pair of connecting arms having their one ends connected
pivotally to the other ends of said operating arms,
35 respectively, and their other ends connected pivotally
to said label positioning member.

1 3. A label positioning mechanism according to claim 2,
wherein said biasing means includes a pair of torsion
springs having their one ends retained on said bridge
member and their other ends retained on said operating
5 arms, respectively.

4. A label positioning mechanism according to claim 2,
further comprising a lock lever fixed to one end of said
operating shaft thereby to manually actuate the same.
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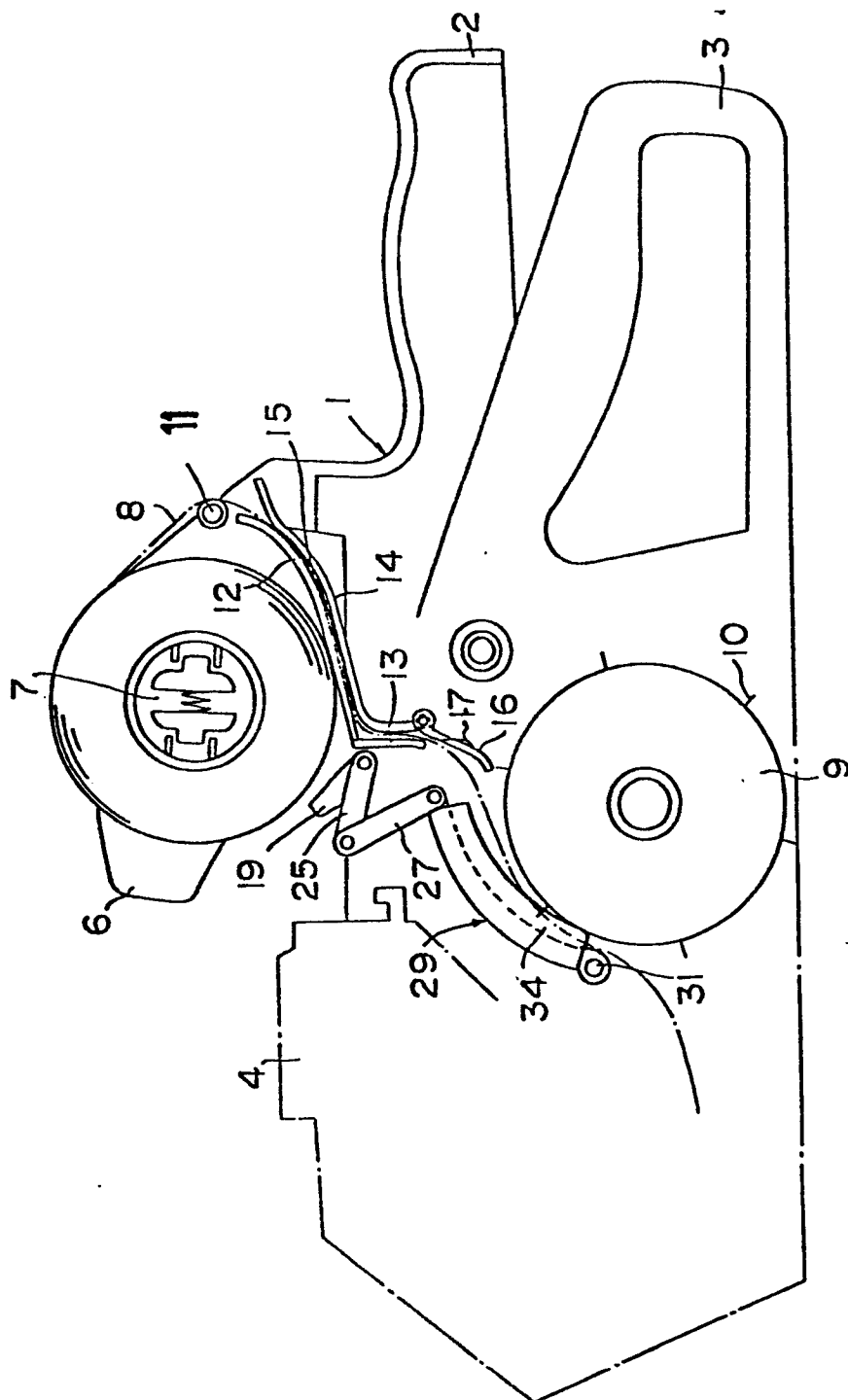
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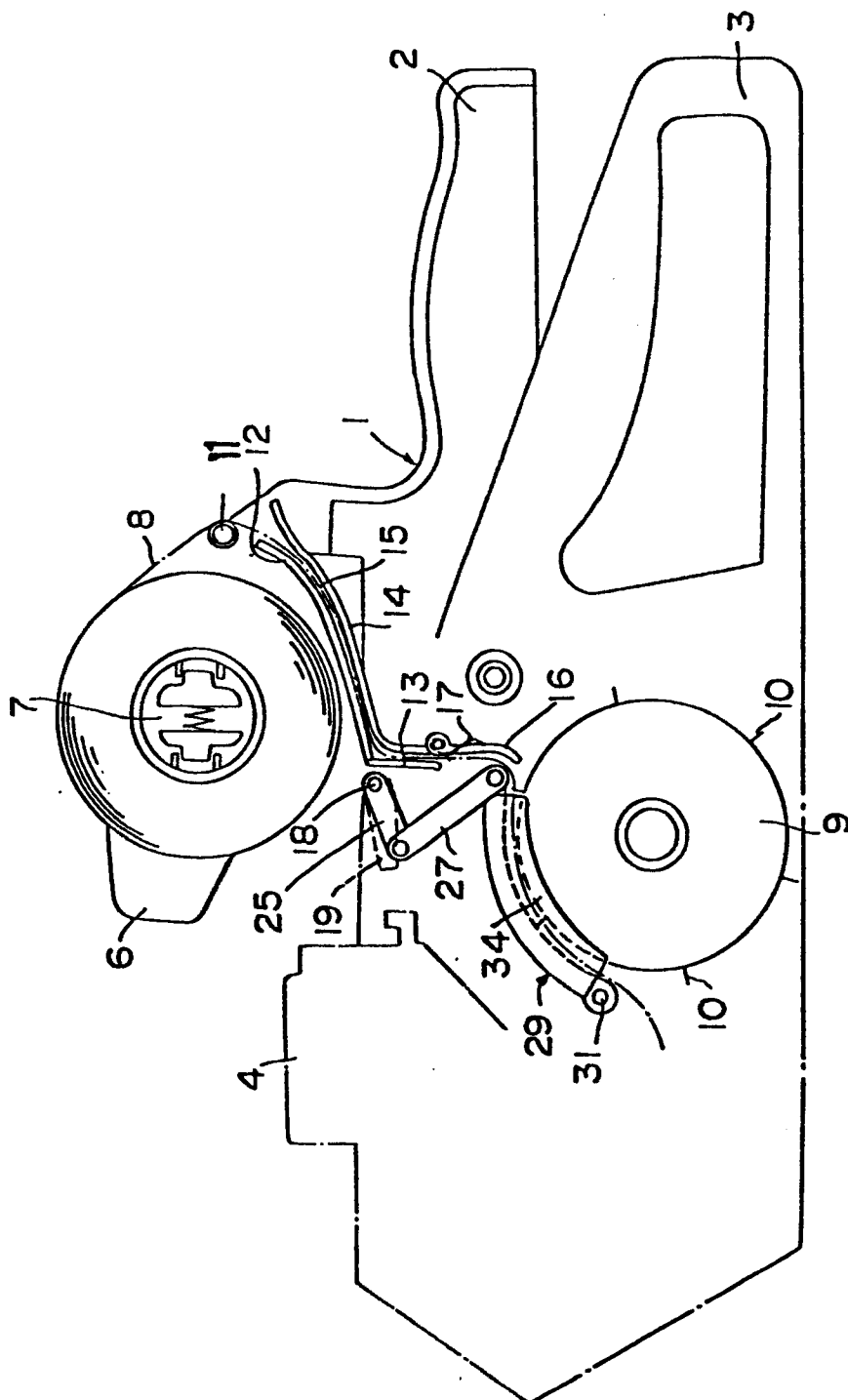
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FIG. 1



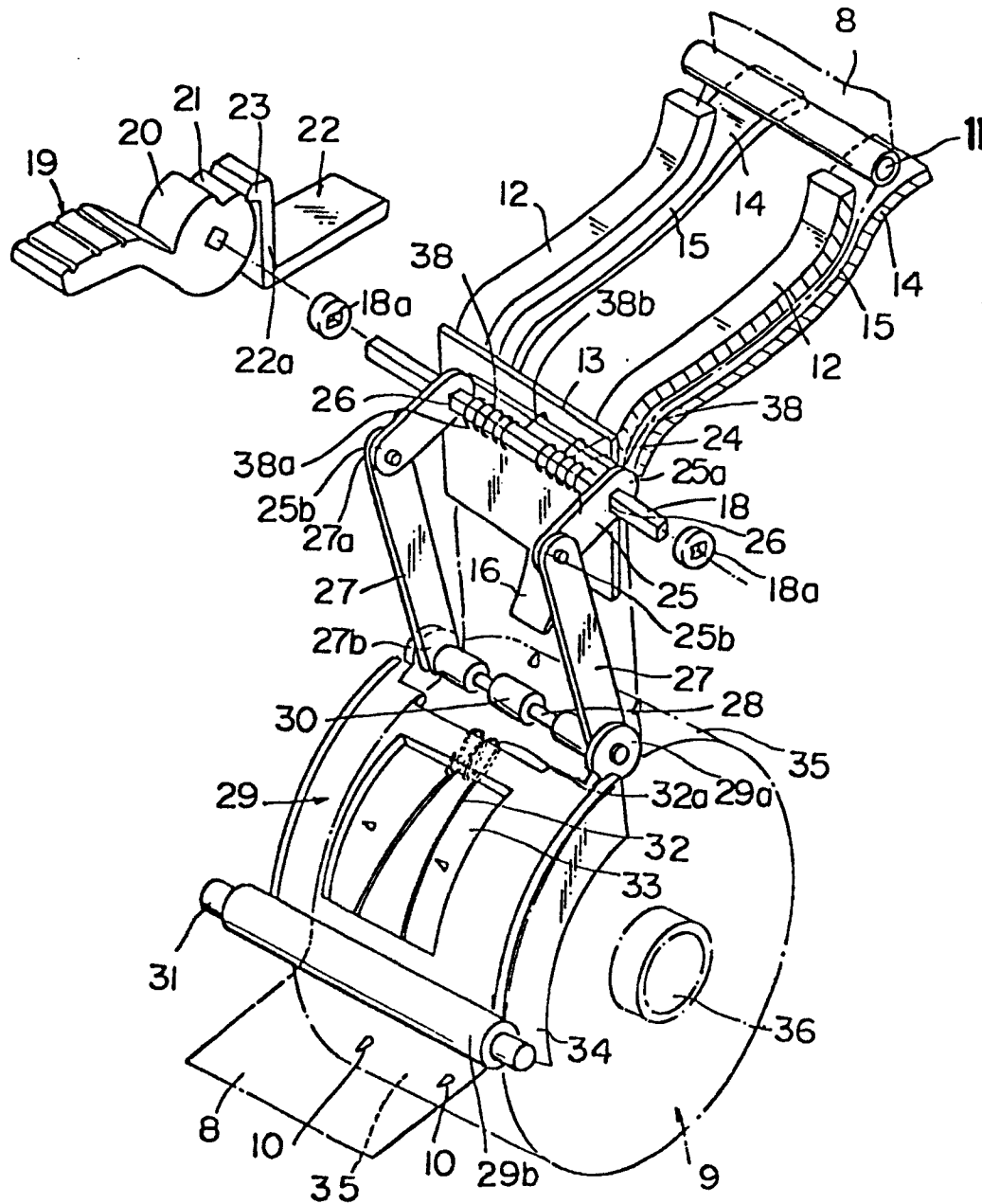
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FIG.2



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FIG.3





European Patent
Office

EUROPEAN SEARCH REPORT

Application number

EP 78 10 0698

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ²)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>DE - A - 2 734 334 (K.K.S.K.)</u> * Page 8, line 15 to page 9, line 21; figures 1,2 * --- <u>FR - A - 2 202 499 (K.K.S.K.)</u> * Page 8, lines 26-39; figure 2 * --- <u>NL - A - 78 01161 (K.K.S.K.)</u> * Page 7, line 31 to page 9, line 1; figure 1 * ----	1,2 1,2 1,2	B 65 C 9/18 11/02
			TECHNICAL FIELDS SEARCHED (Int.Cl. ²)
			B 65 C
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
			&: member of the same patent family, corresponding document
☒ The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19-04-1979	Examiner VROMAN