2007

PATENT ATTORNEYS

EXAMINATION

PAPER D

The New Zealand Law and Practice
relating to Preparation of Specifications for New Zealand
Patents

Regulation 158 (1) (d)

Duration: 4 hours (plus 10 minutes for reading)

Notes to Candidates

1. When preparing provisional specification for question 1 please do not prepare what is commonly known as the title page for the specification.
2. You are to assume that there is no prior art apart from that set out in the questions.

Question 1

Your client has developed an invention for application to writing instruments and refills for writing instruments.

Your client informs you that known writing instruments suffer the problem of air mingling with ink when the ink is introduced into the instrument (or the refill). Over time, and with changes in temperature or pressure, the air bubbles can cause the writing instrument to provide a discontinuous flow of ink when being used, or to leak ink.

Your client's writing instrument has an ink reservoir as shown in the attached drawing labeled Figure 1.

Your client explains that the ink reservoir differs from those presently available in that there is a smooth transition at that part of the reservoir indicated by the angle A. Known constructions have an abrupt step. Ink is injected into the body from the end near the writing tip and your client has found that the step can cause a disturbance in the flow of ink which leads to air being entrained in the ink. Your client states that the angle A is 22 degrees but could be in the range of 4 degrees to 40 degrees.

After ink has been injected into the reservoir, then the known process is to press-fit the writing tip in place, inject an ink-follower such as grease into the other end, and fit an end plug.

Rather then inject grease into the reservoir, your client uses an ink composition in which known ink (which is water based) is mixed with an oil based substance that can act as an ink-follower. After injection of the mixture into the reservoir, the reservoir is centrifuged about the plug end so that the composition is flung toward the tip. This separates the ink from the ink-follower so that the ink-follower forms the required barrier. The centrifuge step uses a special clamp that clamps onto the plug end of the reservoir. Your client considers that this leads to

an article that has improved writing properties. Your client states that the centrifuge process may also help remove air from the ink.

Draft a provisional specification for your client. You may use the second copy of Figure 1 provided with this question paper as part of your provisional specification, should you wish to do so, and hand this in as part of your answer paper.

45 Marks

FIG. 1


A

Question 2

Your client has made an invention relating to a writing instrument. Your client explains that the instrument includes a new and useful mechanism for expanding the length of the instrument while extending a writing tip from a retracted position in the barrel to a writing position.

Your client explains that for purposes of convenience pens and pencils are sized to fit with other products they are used with, such as a miniature pen provided with a date planner or a golf pencil stored on the steering wheel of a golf cart. These smaller pens and pencils are non-refillable and must be discarded when the ink or lead is used up. While these writing instruments are a compact, convenient size for storing, they are not as comfortable to write with and suffer the problem that they can be difficult for some people to use.

Your client informs you that telescoping writing instruments having spiral grooves and followers in overlapping body sections are known. These writing instruments have at least three movable body sections which move both rotatably and longitudinally relative to each other to either increase or decrease the length of the writing instrument. Follower pins in one section correspond to a spiral groove in another section, so that pulling the ends of the writing instrument cause the middle section to rotate while the instrument lengthens and the writing tip is exposed.

Your client's writing instrument is described in the attached patent specification and drawings (labeled "Question 2 Patent Specification") that your client prepared herself and filed as a provisional patent specification with a New Zealand patent application approximately ten months ago.

Since filing her provisional patent specification your client has devised what she considers to be an improved embodiment. Your client provides a brief description and drawings of the improved embodiment, which is attached (labeled "Question 2 Improved Embodiment). Your client is more interested in marketing the improved embodiment as she has found the first embodiment described in her provisional specification to be unreliable. Your client has publicly disclosed the improved embodiment.

A search has also located a relevant prior published document, being an abstract of NZ712345, which is attached. The abstract provides all the information you need to be aware of about the prior art.

Prepare a set of claims for your client's invention that distinguish the invention from the prior art.

It is not necessary to prepare a description.

55 marks

Question 2 - Patent Specification

This invention relates to a variable length pencil.

FIG. 1 is an exploded view illustrating components used in the present invention.
FIG. 2 is a sectional view illustrating a contracted position of the present invention.
FIG. 3 is an enlarged view of a portion in FIG. 1 and FIG 2.
FIG. 4 is a sectional view illustrating an expanded position of the present invention.
FIG. 5 is an enlarged sectional view in a horizontal plane through the expansion mechanism shown in the preceding figures.
FIG. 5A is a cross sectional view of a variation of the expansion mechanism.

A hollow inner housing 20 is provided at a central part of the instrument. A first outer housing 40 is located on an outer circumference of an upper portion of the inner housing 20, and a second outer housing 60 is fixed to a circumference of lower portion of the inner housing 20. A head part 10 is fixed to an upper portion of the first outer housing 40 and a moving part 50 is slidably received in the second outer housing 60.

The first outer housing 40 can be moved upwardly or downwardly along the inner housing 20. On an inner circumference of the lower end of the first outer housing 40, a protrusion 40A is formed inwardly, and a protrusion 20A is formed outwardly on an outer circumference of the upper end of the inner housing 20. Thus, range of upward movement of the first outer housing 40 is constrained.

An expansion mechanism 400 is located in the inner housing 20. The mechanism 400 comprises upper and lower rollers 401 and 402 mounted in the inner housing. Each of the rollers 401 and 402 can be rotated about each of pins 401A and 402A, respectively. Both ends of the pins 401A and 402A are fixed to the inner housing 20 and both pins 401A and 402A are spaced from each other.

The mechanism 400 further comprises a belt 403 of which first and second protrusions 403A and 403B are formed on outer surface. The first and second protrusions 403A and 403B are opposite from each other. The upper and lower rollers 401 and 402 are connected by the belt 403.

The head part 10 fixed to the upper end of the first outer housing 40 comprises a head 11 and a rod 102 fixed to a lower end of the head 11. When the first outer housing 40 to which the head part 10 is fixed is combined with the inner housing 20, the rod 102 is received in the first outer housing 40. A recess 102A is formed at a side of lower portion of the rod 102A.

The second outer housing 60 in which the moving nib or writing part 50 is received is fixed to the lower portion of the inner housing 20 and may be formed integrally with the housing 20. The moving nib part 50 consists of a reservoir 51 and a nib 53 fixed to the lower end of the reservoir 51. A rod 502 is fixed to top end of the reservoir 51. A recess 502B is formed at a side of upper portion of the rod 502.

When the first outer housing 40 to which the head part 10 is fixed, and the inner housing 20 in which the mechanism 400 is mounted and the second outer housing 60 in which the moving part 50 is received is are assembled as shown in FIG. 2, the recess 102A of the rod 102 of the head part 10 receives the first protrusion 403A of the belt 403 and the recess 502B of the rod 502 of the moving part 10 receives the second protrusion 403B of the belt 403.

To draw-out the nib 53 of the moving part 50 from the second outer housing 60, the head 11 is pulled-up as shown in FIG. 2 and the rod 12 is then moved upwardly. Since the first protrusion 403A formed on the belt 403 is received in the recess 102A of the rod 102, the belt 403 is moved in direction indicated by an arrow I in FIG. 3 in response to the upward movement of the rod 102. Therefore, the rod 502 of the moving part 50 is moved downwardly by the movement of the belt 403 since the recess 502B of the moving part 50 receives the second protrusion 403B formed on the belt 403. As a result, the moving part 50 is moved downwardly in the second outer housing 60 and the brush 53 is exposed to outside of the second outer housing 60 as shown in FIG. 4.

At the initial position, as shown in FIG. 9, the first protrusion 403A received in the recess 102A of the rod 102 is adjacent to the lower roller 402 and the second protrusion 403B received in the recess 502B of the rod 502 is adjacent to the upper roller 401. Therefore, a moving distance of the head part 10 and the moving part 50 can be maximized when a distance between the upper and lower rollers 401 and 402 is limited.

Although the rods 102 and 502 are shown to each have the only one recess, and the belt 403 is shown to have only the two protrusions 403A and 403B received in the recesses 102A and 502B, the number of protrusions and recesses is not limited.

As shown in FIG. 4, after an expansion operation is completed as described above, an entire length of the pencil is further increased as much as twice of a maximum moving distance d1 (distance between the pins 401A and 402A) of the each protrusion 403A and 403B, that is, a length 2d1 which is a moving distance d1 of the first outer housing 40 added an exposed length d1 of the brush 53 of the moving part 50.

To retract the exposed nib 53 into the second outer housing 60 after the pencil is used, the head 11 of the head part 10 is pushed down, and the process described above occurs in reverse.

FIG. 5 is a sectional view taken along line D-D of FIG. 4 and shows the belt 403 wrapped on the upper roller 401 which is mounted rotatably in the inner housing 20 by the pin 401A. Also, FIG. 5 shows the relation between the rod 102 of the head part 10 and the belt 403 and between the rod 502 of the moving part 50 and the belt 403.

In FIG. 5A, a slightly different expansion mechanism is shown in which the band 403 does not have protrusions 403A and 403B. Instead, the band simply links the rollers. Outer edges of the rollers protrude beyond the band 403 and engage with the head part

and nib part. The engagement may be by simple frictional contact between materials having a high coefficient of friction on the periphery of the rollers and the corresponding surfaces of the head and nib parts. Other arrangements could be used e.g. splined or toothed surfaces.

In the present invention as described above, the nib is extended outside of the outer housing and the entire length of the pencil is increased by simply pulling the head.

FIG. 1

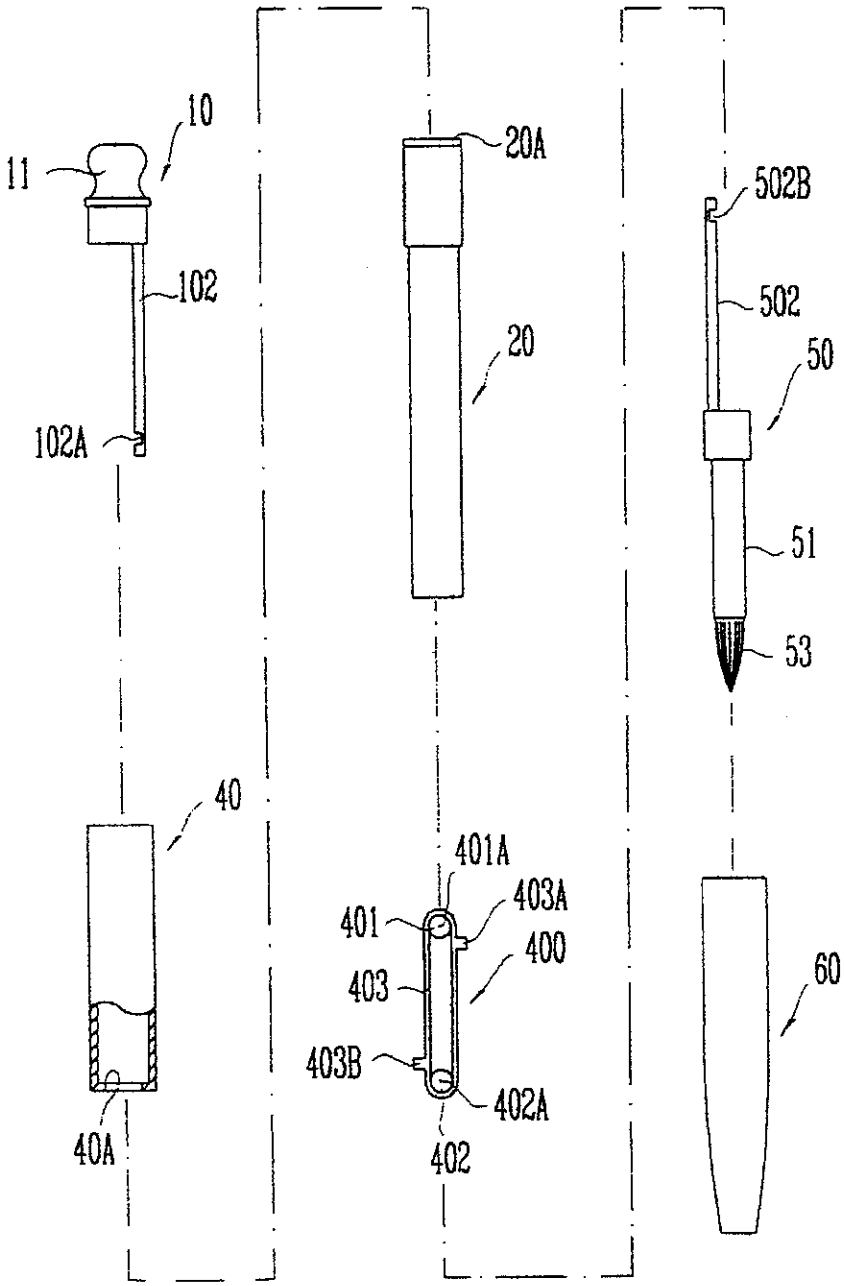

10
11
102
102A
20A
20
502B
502
50
51
53
40
40A
401A
403A
401
400
403
403B
402A
402
60

FIG. 2

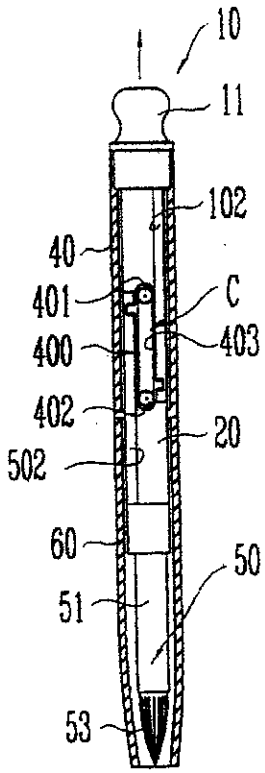

10
11
102
40
401
C
400
403
402
20
502
60
50
51
53

FIG. 3

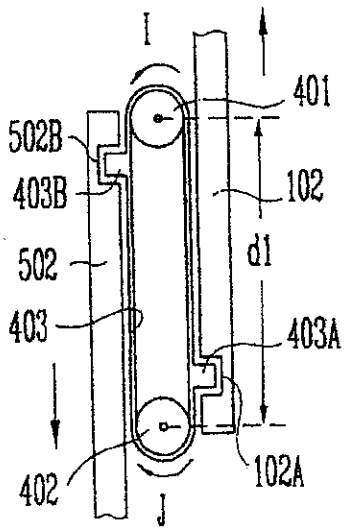

I
401
502B
403B
102
d1
502
403
403A
402
102A
J

FIG. 4

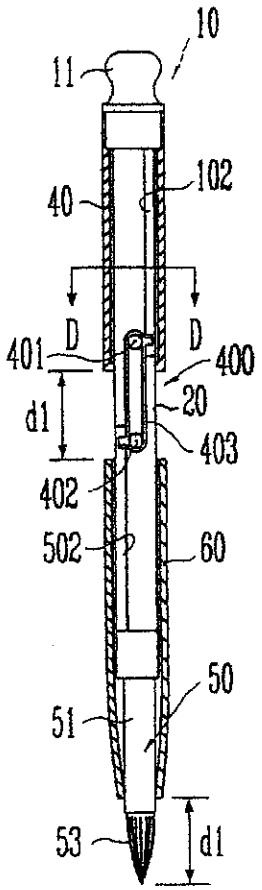

10
11
102
40
D
D
401
400
d1
20
403
402
502
60
50
51
53
d1

FIG. 5

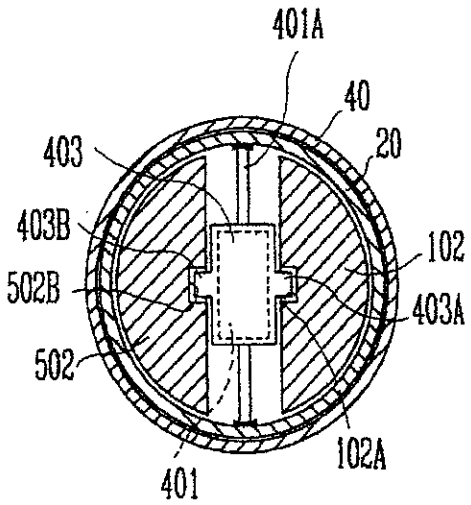
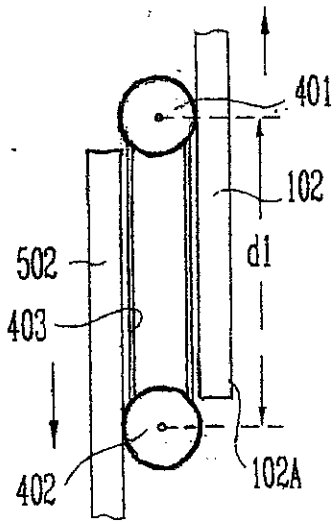

401A
40
403
20
403B
102
502B
403A
502
102A
401

FIG. 5A



Question 2 - Improved Embodiment

FIGS. 6-8 show a new improved embodiment of the invention.

Like reference numerals are used to refer to like features of the original embodiment and the new embodiment.

The expansion mechanism 300 comprises a body and three pinions 301, 302 and 303.

The first, second and third pinions 301, 302 and 303 are mounted rotatably by the pins (not shown) and meshed with each other. Therefore, the first and third pinions 301 and 303 are rotated in the same direction as shown in FIG. 8 via the linking pinion 302. Also, a diameter of each of the first and third pinions 301 and 303 is larger than that of the second pinion 302 located between the first and third pinions 301 and 303.

Although the only three pinions 301, 302 and 303 are shown and described in FIG. 6, FIG. 7 and FIG. 8, the number of pinions may be more than 3 (three) and should be odd so that the upper-most pinion and lower-most pinion are rotated in same direction. Also, the diameter of upper-most and lower most pinions is greater than those of the pinions located between the upper-most and lower most pinions.

When the splined rack 12 fixed to the head 11 is moved upwardly, the first and third pinions 301 and 303 meshed with the rack 12 are rotated in same direction indicated by an arrow E in FIG. 8. Therefore, the rack 52 of the moving part 50, which is meshed with the first and third pinions 301 and 303 at opposite side of the rack 12 of the head part 10, is moved downwardly. Accordingly, the moving nib part 50 is moved downward in the second outer housing 60, and some portion of the reservoir 51 and the nib 53 of the moving nib part 50 are extended outside of the second outer housing 60.

In FIG. 7, a moving distance of each of the splined racks 12 and 52 from an initial position of FIG. 6 to a final position of FIG. 7 is indicated as d2.

[0041] As shown in FIG. 7, after such operation is completed, the length of the pencil is increased as much as moving distances of the racks 12 and 52, that is, the length of the pencil is increased as much as the length 2d2.

The invention can be used for pens, pencils, and other implements of a similar nature such as eyebrow pencils or lipstick devices for applying make-up.

FIG. 6

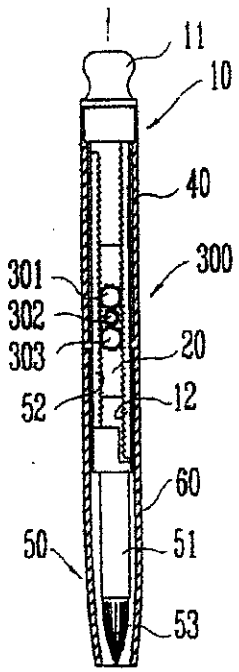

11
10
40
300
301
302
303
20
52
12
60
50
51
53

FIG. 7

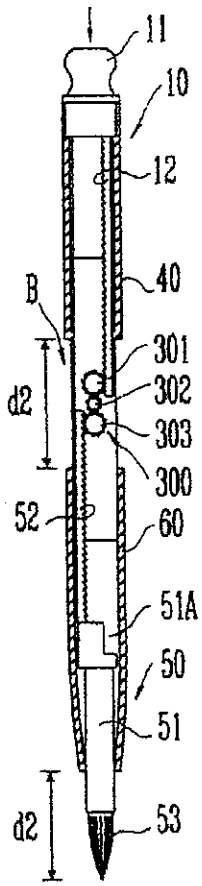
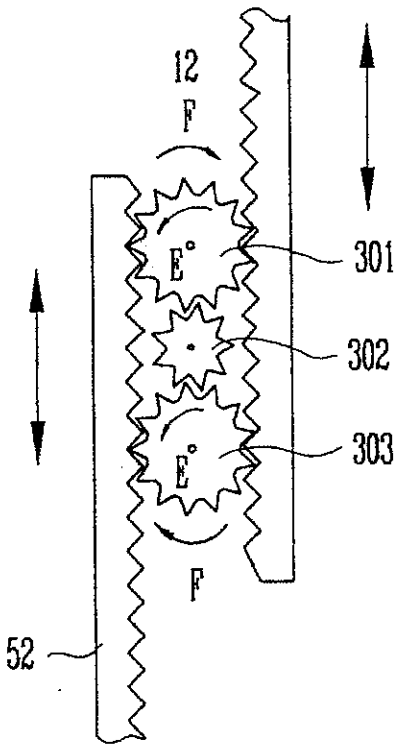

11
10
12
40
B
301
d2
302
303
300
52
60
51A
50
51
d2
53

FIG. 8



Abstract NZ712345

A pen has a refill 65 located in a barrel 40. The refill can be disposed in a retracted position in which the writing tip 10 is inside housing part 50, or an extended position (shown) in which the tip 10 is extended outside the housing. The refill is attached to a track 95. An end cap 30 can slide over barrel 40 and has a track 35. The tracks 35 and 95 engage with a rotatable gear having two sets of teeth 75 and 77. Axial movement of the cap 30 relative to the housing part 50 causes relative movement between the tracks 35 and 95 via gear 70 to thus move the pen between the expanded or retracted positions.

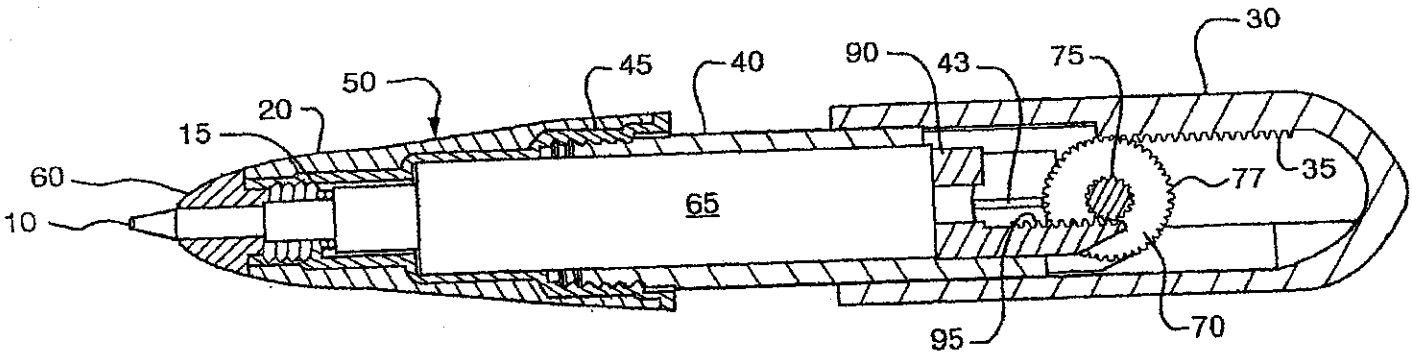


FIG. 1