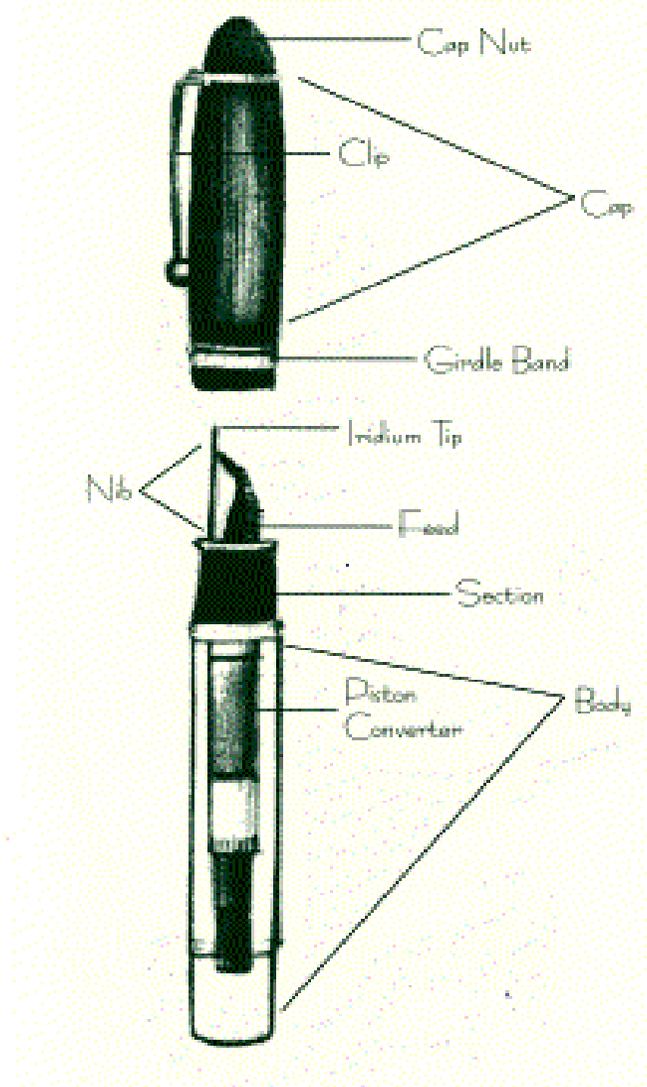
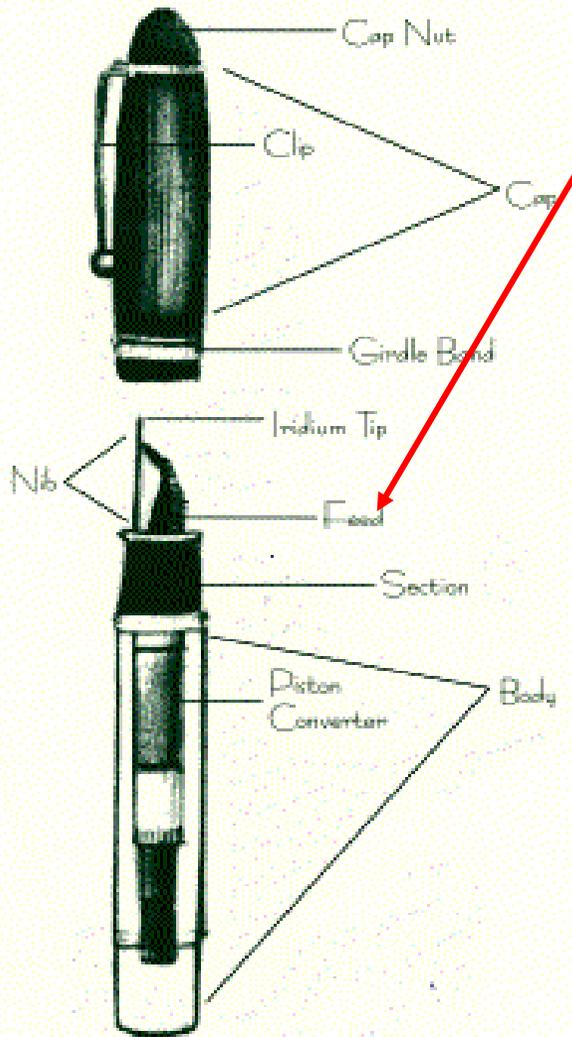


# Fountain Pen Components



# Components



## The Feed:

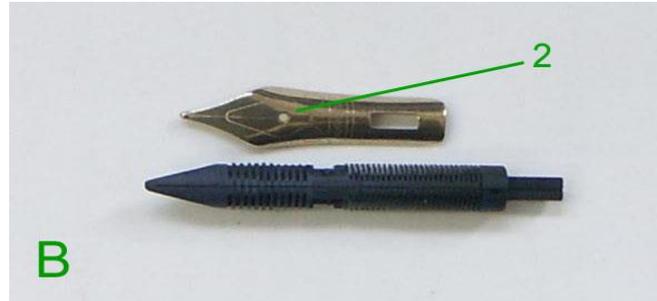
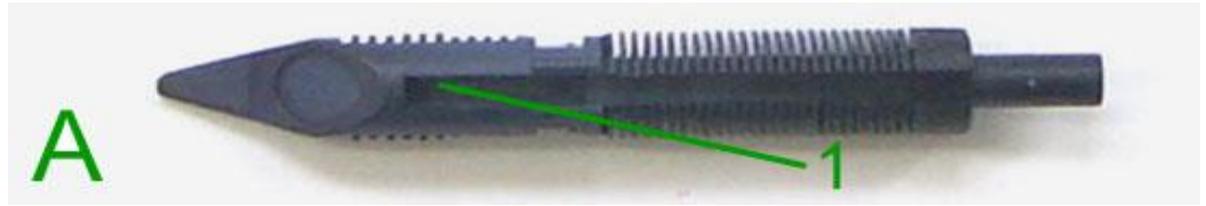
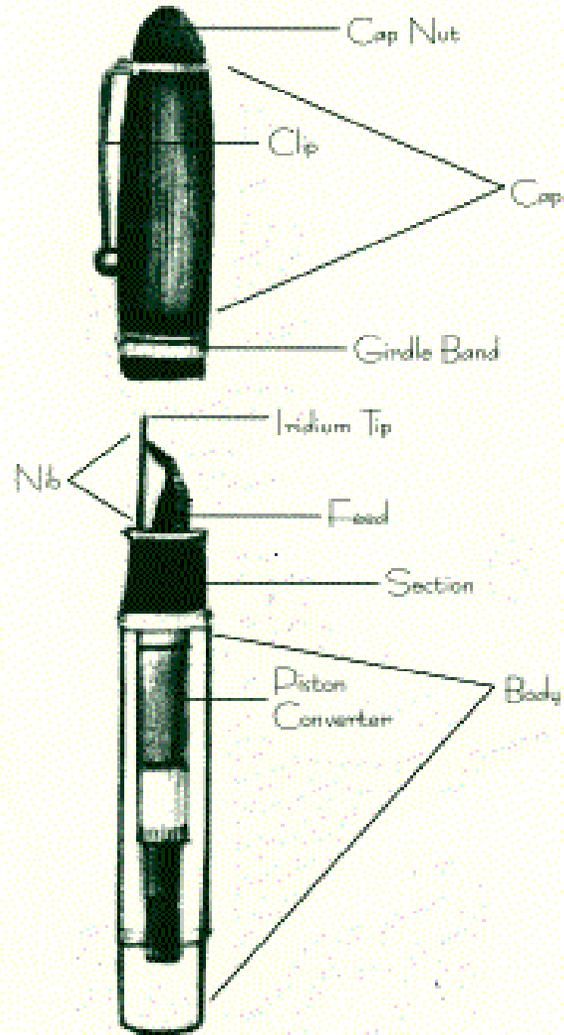
Before you could have a FP, there had to be a system to deliver the ink into the nib. The ink flows down the feed and is released or contained through a combination of capillary action, surface tension and a vacuum being created in the reservoir.

Capillary action describes the way liquids like water or ink hold together and cling to the surface. Capillary action is the reason paper towels soak up liquid

Surface tension is what holds ink together on a surface i.e ink on a penny

The vacuum is what you use to clean a carpet – in this case a vacuum is an absence of most matter, including oxygen

# Components



- A. This is the underside of the feed. The feed fits underneath the nib and helps the ink flow to the point. The many grooves are there to hold as much ink as possible.
  - 1. This channel feeds air back into the ink reservoir.
  
- B. The nib fits directly over the top of the feed.
  - 2. This small hole in the nib is for feeding air back into the ink reservoir and drawing in ink.
  
- C. Here are the two parts joined as they would be while in the nib block

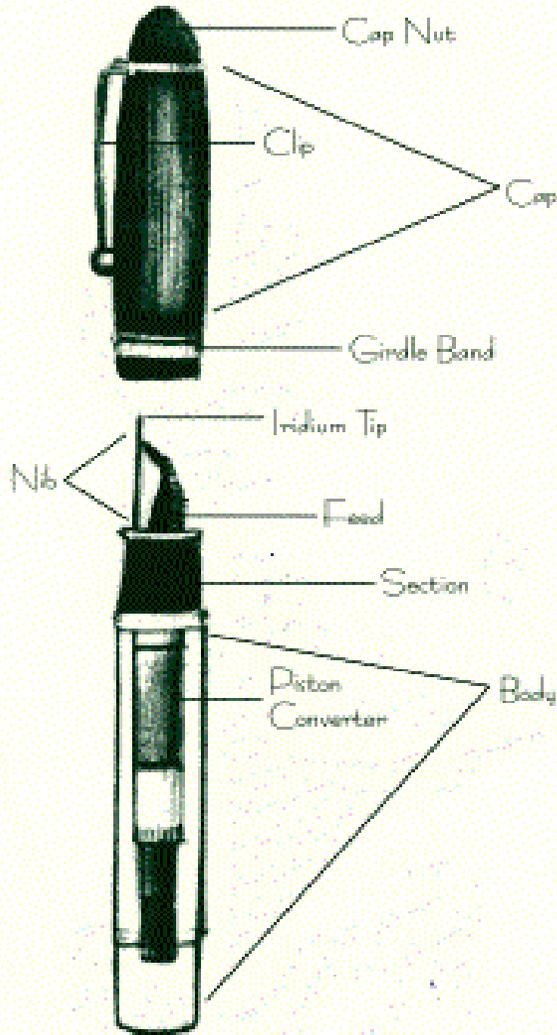
# Components

## The Reservoir

Modern FP's generally come in 2 varieties, cartridge or convertor/piston. Most filling types use the capillary action of the ink and the creation of a vacuum through the use of a piston.

Air is pushed out of the piston creating a vacuum and when the pressure is released the ink is drawn into the tube to fill the reservoir.

Newer pens are easier to maintain and convertors rarely need to be replaced if cared for.



# Components

## Convertor/ Piston or Cartridge

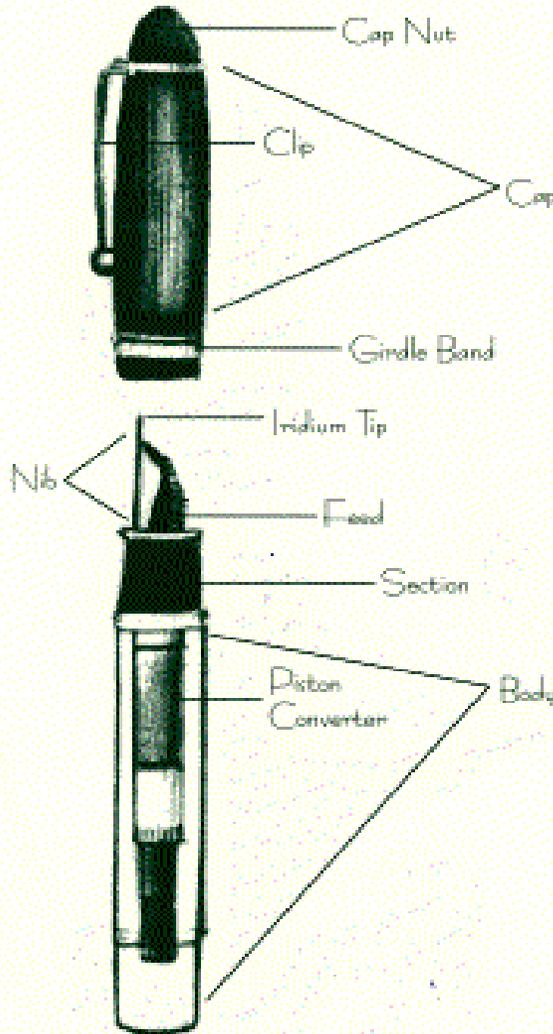
Many pens with built in pistons have the advantage of a very large ink reservoir.

Another advantage of the piston or convertor is the wide variety of inks that are available when drawing from an ink bottle.

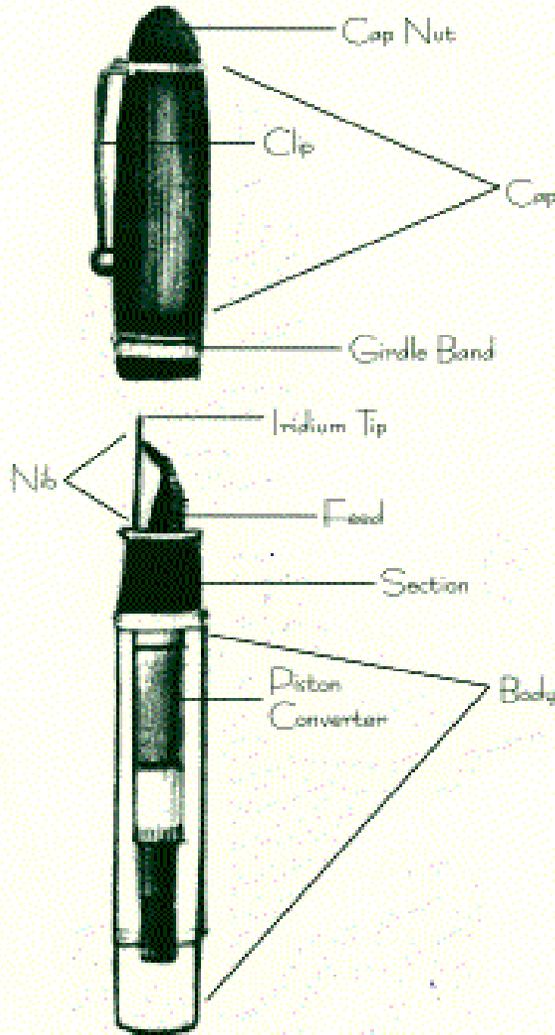
However most companies now have ink cartridges in a wide array of colours.

Almost all companies now offer pens that can use cartridges. This is in fact probably the most common filling method for fountain pens now. The cartridge offers the possibility of filling your pen in a quick and non-messy way. This enables the user of the pen to refill when in a business meeting, in the middle of a test, basically anywhere

You never have to carry a bottle of ink that can spill into your briefcase or bag and cartridges are generally only about an inch long so they'll fit in almost any pocket or compartment.



# Components



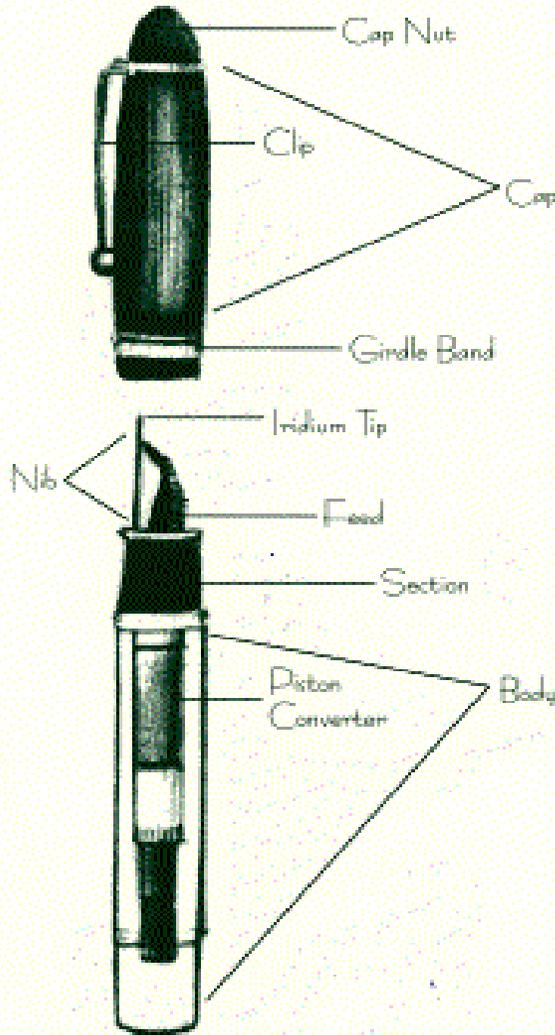
## The Nib:

The user can 'feel' the pen on the paper, through the nib. When used, the pen produces an elegant line with an almost calligraphic appearance. The use of precious metal for the nib of a FP improves the performance and increases its life span. Metals corrode when contact with ink takes place, thus, gold is the preferred choice of material, as its resistant to corrosion. The lease expensive FPs have SS or Gold Plated nibs.

It takes about 4 months for a nib to wear slightly, relative to the way the Writer holds the pen to the paper. Thus, a customised point, which is unique to the individual owner, is produced. FPs should therefore not be shared.

When selecting a FP, the buyer should consider the weight of the pen. Pens manufactured in metals are heavier than those in moulded resins or plastic. The weight distribution or balance of the pen may be decided when the users holds or writes with the pen. Pens are tested with caps on / off to ensure the pen remains balanced.

# Components

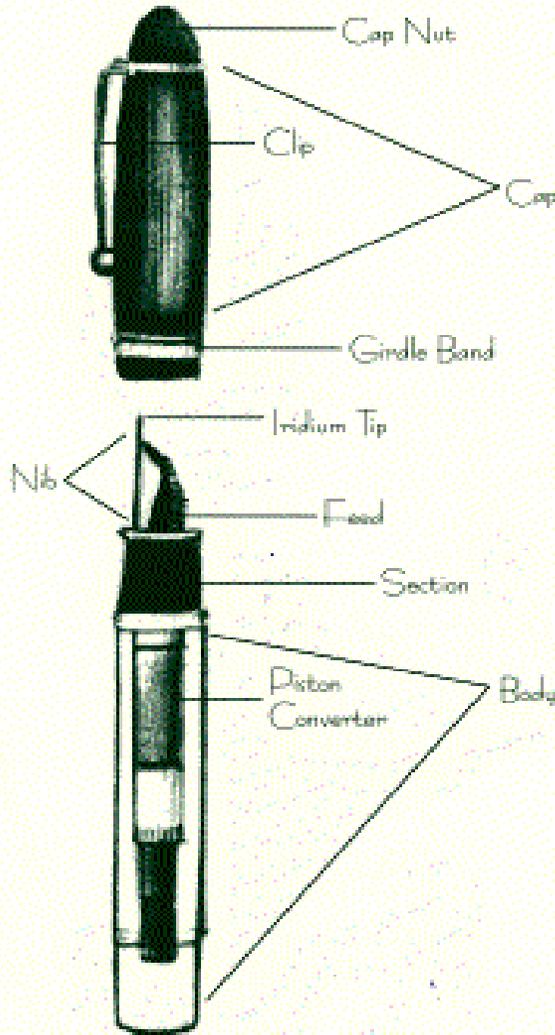


## The Nib:

Nibs are available as follows:

1. Standard – which is suitable for everyday and standard correspondence. This is the most popular nib and is often medium size
2. Oblique – during manufacture the nibs are cut at an angle. This produces a line with thinner up strokes than down strokes. Reversed oblique nibs are used by left handers.
3. Italic – These nibs are pelted straight cut and precise for slow writing when an italic script is preferred. Again oblique italic are ideal for left handers.
4. Calligraphy – Nibs are often available with a range of widths relative to the size or height of character desired. Direction of the nib's motion on the writing surface has the effect of creating many thicknesses
5. Extra fine, broad and script are also available.

# Components



## The Nib:

Pen nibs are produced by mass flow production but broken down as follows:

1. The gold ingot is rolled to 20mm thickness. The ingot is annealed to ensure the nib is flexible. The ingot is cold bench pressed to ensure further flexibility and resilience.
2. The first die is cut
3. The iridium is soldered onto the gold
4. The gold / iridium is sanded down
5. The form is rolled between cylinders. This thins the body of the nib. The point of the nib should measure 0.1mm to ensure it fits tightly with the pen
6. Other minor parts needed for the nib are cut using a bench press
7. The eye of the point is drilled out
8. The nib is curved, in a process known as 'impressing curvature'
9. Using a cutting disk, the nib is slit to the eye of the nib
10. The nib is re-sanded to the grade required – this can be fine, med or broad
11. The upper part of the nib is polished to jewellery quality standards. The underside remains dull in appearance as this assists the regulation of ink flow.

# Caps & Clips

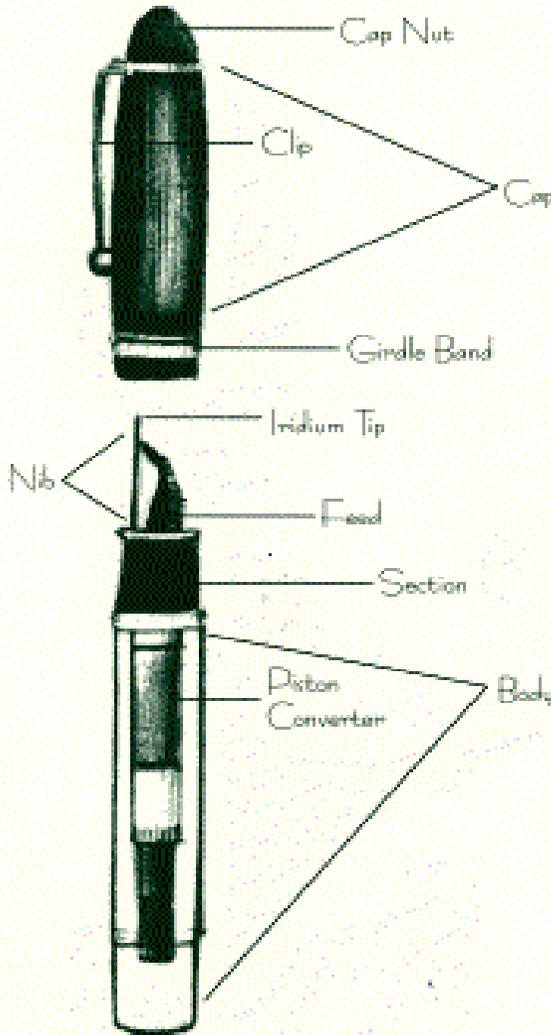
## Caps & Clips

The functions of the FP cap are:

1. To protect the nib and feed against damage
2. To seal off the nib and feed from outside air so, that when removed, they will write as soon as the nib touches the paper
3. To hold the pen in an upright position by hooking the clip onto a pocket

The cap is more than often a cylinder to which a clip, an inner cap or spring Clutch and decal are attached. The main problems with caps are:

1. Cracks in the lips
2. Cracks at the top
3. Deformation (shrinking) near top
4. Threads stripped
5. Clips loose or broken
6. Bands missing



# Caps & Clips

## Cracks:

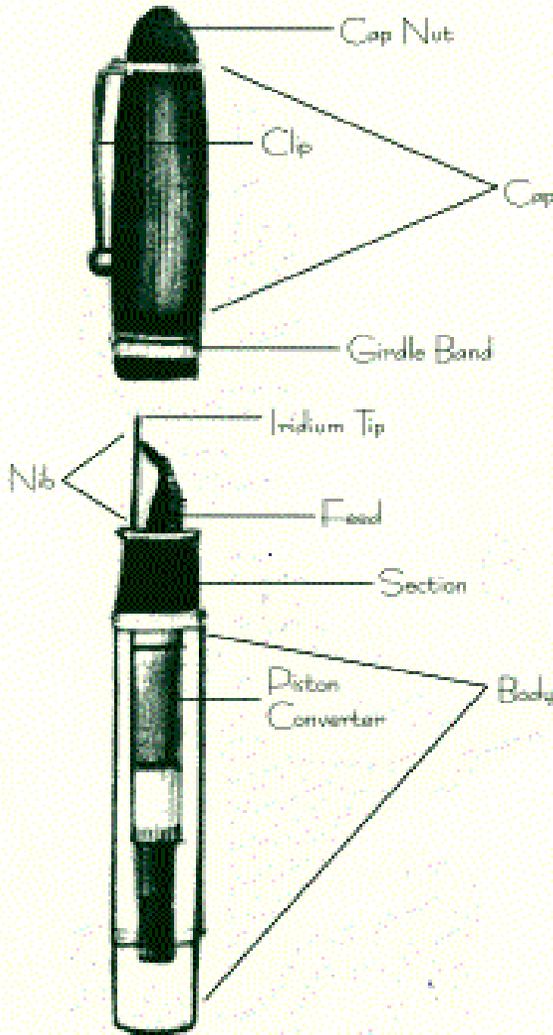
Before you start attacking a crack in a cap, you should know what material the cap is made of – you can then choose the correct glue or solvent.

If it is a cellulose nitrate cap then solvents for cellulosic paint is excellent as well as nail varnish. Hard rubber demands two-pack resin.

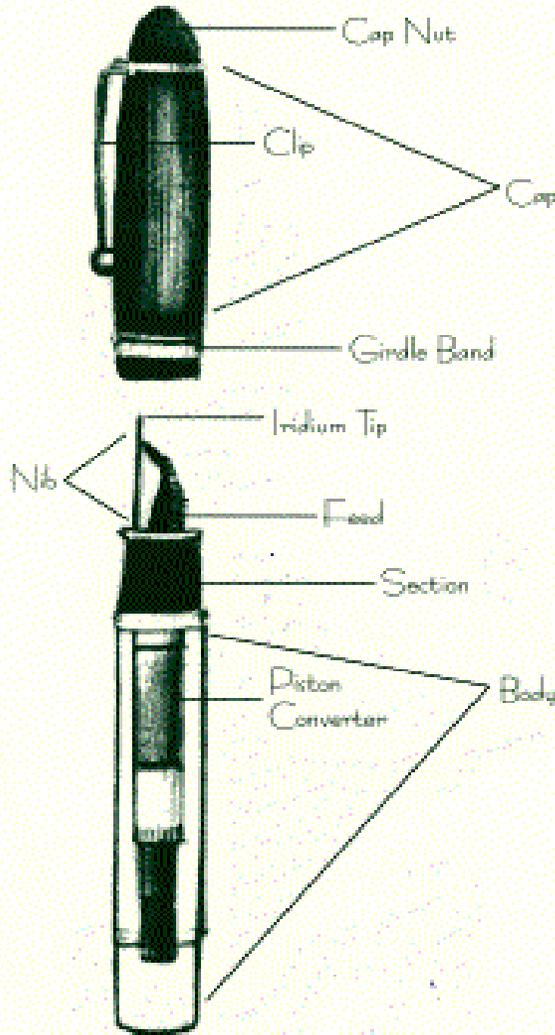
It is always best to ensure the crack is tightly squeezed during hardening and this is achieved by fitting a band.

## Barrel Bands:

Barrel bands have adorned caps since the latter part of the last century. Grooves are cut around the cap and a single or multiple ring or band is fitted over the groove and bumped into the slots with a power tool. Replacement bands can be fitted by a specialist or, if loose, you can add a couple of dabs of solvent or glue



# Caps & Clips



## Inner Caps:

These often have to be removed before you can fit a side clip – there is a reliable tool available to do this. Not all inner caps are fixed and can be a screw-in top, used with a sing style clip, which is easy to service.

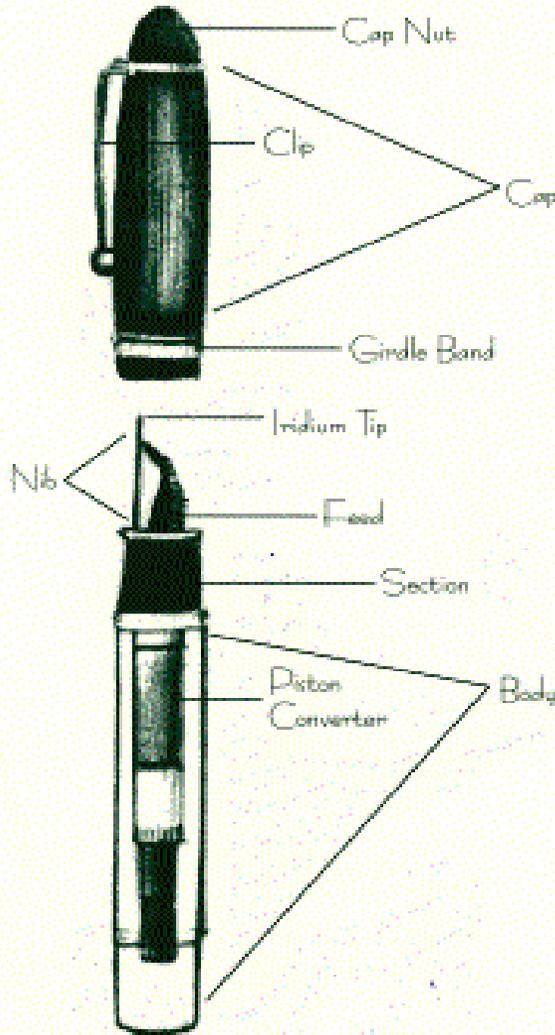
## Air Holes:

Air holes should be kept clean. Use a pin to remove clogged dust as the hole serves to reduce condensation and also reduce the suction effect when removing the cap (pen caps now have a requirement to have holes in them to facilitate air and reduce choking on the cap).

## Overturning Caps:

These are caps which do not engage the barrel due to wear of the cap / barrel. Replacements should be sort as it is a major task rebuilding the inside of the cap with resin and re-threading. You can try reducing the the section at the nib end or barrel end which allows the pen to enter on to new threads and only needs one / two threads to get a good hold. Clean the threads on the cap and barrel well and wipe with a little WD40.

# Caps & Clips



## Rivet / Plate Clips:

These are not easy to repair but providing the inner cap can be removed then it is possible providing the correct pins or back plate is made in soft metal.

## Ring Clips:

These are usually called Washer Clips and were produced in the 30's to fit the new style caps which had a loose, detachable inner cap integral with the top and, when screwed up, anchored the clip. The clip can be fragile on the ring and break but is easily repaired.

## Arrow Clips:

The way of fastening these clips on latter pens is a screw which enters a detachable clutch system. They present little difficulty to replace and tassies are removable with a rubber friction pad (A tassie is a trim bezel applied to the end of the barrel or cap (or both), frequently as a ring surrounding a "jewel" or other decoration, as shown here.

N.B. Clips are always the weakest point of the pen, apart from the nib.

# Maintenance / Repairs / Cleaning

## General Care:

Most FP's do not need a lot of looking after – if the pen is working, it will usually stay that way as long as it is not abused:

Some FP's are safer than others when flying - some FP's tend to lose a bit of ink into the cap if they're shaken about

The cap should also be cleaned regularly but ensure it's dry otherwise it may look as the pen is leaking

## Ink:

1. Only ink intended for fountain pens should be used – if not it will block the feed
2. If the feed is blocked then just rinse through and flush it out with water
3. Rubber or casein feeds should not be soaked as they can be damaged by soaking water
4. The feed should be flushed out with water either every refill or every couple of refills, especially if you are changing ink brand or colour. Different inks can cause a reaction and when the sediments are mixed, it will block the feed.
5. If you are using saturated ink, this should not be left in an unused pen and they need to be flushed out more than standard ink.
6. Before putting a pen away, it is a good idea to clean any ink out of it – general idea is to flush through with tap water. If there is a convertor, it's easier to fill this and then keep flushing through the pen.
7. For stubborn ink, 'flick' the pen, wrapped in tissue, with the nib downwards.

# Maintenance / Repairs / Cleaning

## Cleaning:

Some say that toothpaste, as it is slightly abrasive, will help polish plastic pens and buff out minor scratches. Customers should seek advise before doing this on an expensive pen. A microfibre cloth is the best thing to to give plastic parts a clean. Polishing by hand with a microfibre cloth can produce heat which can damage the plastic is used vigorously so you need to take care when polishing.

## Blocked Feeds:

1. A blocked feed can be freed by soaking overnight in water (not hot) but will depend on the material of the as rubber does not like being soaked.
2. Some people suggest using Parker Washable Blue Quink as it is a weak ink and helps clean other ink residues out of the pen.

## Nibs:

1. Nibs are tricky to work on and only an expert should try to repair a nib.
2. There should be a very narrow gap all the way down the length of the nib – which should be narrow at the tip and wider at the top
3. Tweaking a gap in a nib can be done carefully and gradually as it should be a fraction of a millimetre at it widest
4. If the gap is too wide, ink may not flow at all or it might flow too fast. If it's too narrow, or closed up completely, ink may flow to slow or not at all

# Maintenance / Repairs / Cleaning

## **Nibs (contd):**

1. The separation of the tines (the 2 halves of the split) can be increased using a fingernail. Push one tine up with the nail, then use the same nail to push sideways against the other tine, pushing it outwards. Then repeat for the other tine.
2. If the separation needs decreasing, you can use a fingernail again but this time lift the tine and push it gently across the top of the other one, crossing them over a little.
3. If there is a fluff of paper fibres in the split, use a very fine piece of paper and gently insert it in the hole in the nib and slide along to the split.

## **Nib Polishing:**

1. If the pen is okay but the nib is scratchy, a gentle polish can be enough to transform the way it feels and writes. A nail polishing buffer is ideal for this (not a nail file!!)
2. Depending on how much smoothing the nib needs, start at either the rough or smooth abrasive part and work on down, just rubbing gently and drawing 'o' or '8' characters. Keep testing on paper during the process.

**N.B.: Glue can cause lots of problems – some react with plastic and rubber. A product called Shellac is best to use and can be purchased at any pen repair supplier.**

# Storage of Fountain Pens

1. Filled FPs should always be stored nib up as they would be in a shirt pocket
2. You should never store a pen nib down – GRAVITY WORKS!!
3. Filled FPs should never be stored for an extended period of time – when a pen is filled, consider it a commitment to use it.
4. Storing a pen that is filled with ink may cause the ink to dry and create flow problems and possible piston damage.
5. If the pen is to be stored an an extended period of time, it should be emptied, flushed through and put away.

# Rollerball vs Ballpen



The ballpoint pen now includes a wide variety of grips, ergonomic designs, refills and retractable options.

Its popular cousin the rollerball is clipping at it's heels for writing dominance



# Rollerball Vs Ballpen

Many people are confused about the difference in how a rollerball pen functions compared to a ballpoint pen. Although the pens use very similar technology to function, the ballpoint pen was perfected long before the rollerball and there are a few simple differences.

1. Ballpens use a much thicker oil based ink that is picked up by a small ball bearing and is deposited onto the page as it rolls across.
2. As the ink is so thick and is not water based, the ballpen refill will take many months to dry up before needing a new refill
3. This is why ballpens are able to function with a click or twist and require no cap
4. Rollerball pens use water based ink that is identical to fountain pen ink
5. Because of this, it was difficult to master the perfect rollerball refill
6. All water-based refills require a cap and, if the cap is left off too long, the pen will dry out and you'll need a refill
7. Rollerball pens are popular because of the darkness of the water-based inks and the smoothness of the writing

# Troubleshooting

## 1. **Are you using a good writing technique**

Writing with a FP requires slightly different techniques than writing with a ballpen. A little bit more deliberation is need and a more careful application of pressure. If you're new to FP writing, it can take a few weeks to adapt.

## 2. **Are you using suitable paper**

Contrary to popular belief, FPs do not need ultra-expensive paper and most standard business and writing papers will work fine. If the paper is too thin, not dense or too high in pulp content, the ink can bleed across the paper and make the writing look fuzzy. In some cases the ink can bleed through the paper and soak the sheets underneath. High pulp paper can produce fibres which is picked up by the pen and the fibres need to be plucked out with tweezers or a lint-free cloth.

## 3. **Do you cap the pen properly after use**

Even the best FP's will dry out if left uncapped for more than a few minutes without writing, necessitating new ink to be 'pumped' up from inside the pen before you can start writing again. For this reason, FPs should be capped if you stop writing for a period of longer than a minute or two. This will slow down the drying out period.

## 4. **Can FP's be used on airplanes**

Whenever you fly with a FP, whether checked in or hand luggage, you should ensure that the pens are completely full (so that no air is trapped inside) or completely empty and clean (no ink to leak out). If possible, the pens should be stored point up.

# Troubleshooting

- **Have you cleaned the pen lately**

Obviously you need to clean out your pen if you change ink colours. Even if you use the same ink / cartridge, your pen should be flushed through to remove dry ink from the feed channels.

- **Is the Pen skipping (point intermittently dries up and won't write)**

Skipping often results when the feed is unable to supply ink to the point in a volume great enough to keep up with the writing speed. Possible fixes includes widening the feed channels or loosening the fit of the point against the feed. Both jobs are best left to a pen specialist.

- **Is the pen flooding (point consistently lays down too much ink)**

Flooding results when the feed supplies too much ink to the point. The point can be adjusted to fit more tightly against the feed (again refer to a pen specialist) but a less radical solution would be to use a thicker ink.

- **Poor starting (Pen won't write on the first few strokes)**

Some pens may write wonderfully but require a 'jump start' of some sort when you first put point to paper. Generally pens will work better if you start writing on a downstroke. Bearing down hard will not make the pen write any better and could damage the pen. Ultimately, the solution may be to try a new point.

- **Does the pen blot ( Blots of ink whilst writing)**

Some pens may let out big drops of ink and at the wrong times. This 'blotting' is very similar to flooding and using a thicker ink may help rid the problem. However, most blotting comes from pens that about to run out of ink so changing the cartridge or filling the pen may resolve the issue.

# Troubleshooting

- **Does the pen have a scratchy point (feels like you are scratching holes in the paper)**  
Some pen points are naturally scratchy but a good FP should not be so. Scratchiness is usually caused by roughened, broken or misaligned nibs. The nib should be looked at through a magnifying glass to see whether it looks like a single ball or a lump of metal with a cut down the middle. If you see something wrong, you should seek advice from a pen specialist. Nibs can be buffed with a ladies nail buffer.
- **Does the pen need to be filled frequently**  
On average, you can get anything from a full day to a week of steady writing from one fill of the pen or cartridge, depends on how much writing is done! If you don't something may be wrong. It could be that the pen has a very small ink supply due to a small or short sac. You can have a new, larger sac fitted to fix this problem.
- **Does the pen leak into the cap (or elsewhere)**  
If ink is coming out from anywhere other than the nib, there is a problem. Leaks from the front of the pen may be caused by misaligned or loose fitting feed. In some pens, the nib and feed assembly screw into the front of the pen and this joint may be loose or the internal seal may be broken or leaky. Probably the most common cause of leaks in caps is actually ink that has remained on the nib and then dried in the cap. The best thing to do in this case is clean and dry the cap.