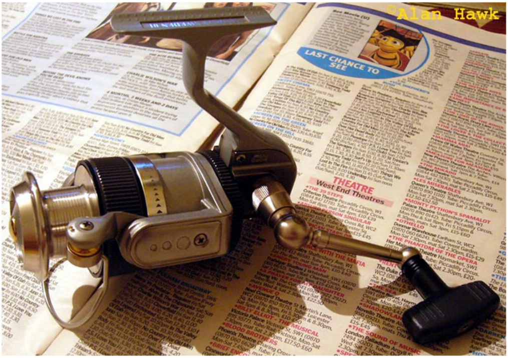
Last Man Standing, Abu Garcia Suveran

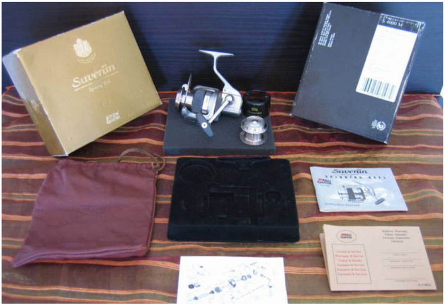
The following review is a revised version of a review I wrote in 2002, titled "Suveran: The last man standing". That original title reflected the fact that at time, I believed that the Suveran was the last remaining spinning reel still being built anywhere in the western world. Things have changed since. Now Zeebaas makes spinning reels in America, Accurate introduced their American built TwinSpin spinning reel, and I've verified that Peerless Bam are still building their world class spinning reels in France. In a twist of fate though, the Suveran was discontinued, and now Abu make all their spinning reels in China.

I was recently asked by a reader about my all time top 3 spinning reels. What must have been 100s of reels that I've used since I was 8 rushed into my head while trying to figure out which three stand out on the top. Reels fought over second and third positions, but there was no fighting in my mind giving the #1 spot to the Suveran, as the finest, most ingenious, and best engineered spinner ever made. The following illustrates why.



This reel imitates no one. Abu seems to have reinvented the wheel with the Suveran following a run of truly uninspired spinning reels. The Suveran is basically a small sized all metal freshwater reel that came in four spool sizes. And I say 'spool sizes' because the four models share the exact same body but with different spools. Suveran 1000M , 2000M, 3000M, and 4000M all have a 5.2:1 ratio, and weigh between 357 grams (12.5 oz) for the 1000 to 390 grams (13.7 oz) for the 4000. The difference in weight comes from the different spools and spool hubs. Spools can be interchanged between 1000 & 2000 models, and between 3000 & 4000 models. Spools of the two smaller reels aren't interchangeable with the spools of the two bigger ones though.

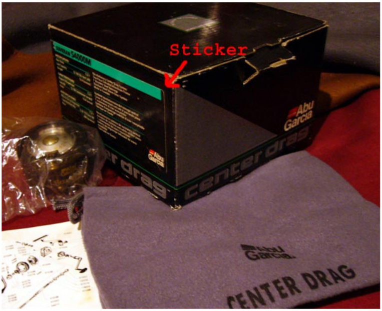
The reel came in two types of packaging.



Suverän
Spinning Reel
Abu Garcia

One was a dedicated luxurious fitted box, with a high quality leather pouch. The Royal Warrant and the text on the top of the box are embossed.

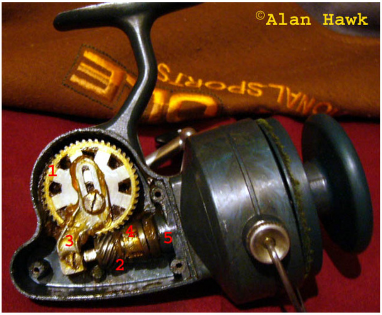
And the other



The other packaging was a simple cardboard box made for "Center Drag" reels, with a sticker (!!!) bearing the Suveran's name stuck on the sides. The pouch that came with it was a cheap cloth one, and was made for the "Center Drag".

I used to think that the cheaper packaging was for the American market only, but then I spotted several ones in that packaging in Europe, some of which were originally bought in Germany and Sweden. Currently the ones in the luxurious box are harder to find, and command a higher price than the other packaging.

To the reel itself

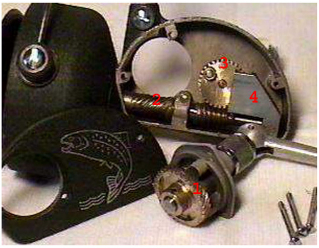


The heart of the Suveran is the 'worm gear' drive. It is hard to pinpoint the first use of this system in fishing reels. Early Hardy Altex spinning reels from the 1930s had a primitive version of that worm gear drive, but the first reel to perfect it was the Alcedo nearly a decade later. The above photo is my Alcedo 2CS gear box showing the main components of that gearing style.

1) Main gear
2) Pinion Gear
3) Oscillation cam
4) Gear adjustment nut
5) Ball race (works as ball bearings but balls are not caged)

The Alcedo was a thing of beauty and precision. They made several models, most popular of which were the 'Micron', '2CS', and the very rare gigantic 'Oceanic' saltwater reel. They were expensive, hard to make and regulate, labour intensive, and generally not commercially viable. That led to the company's bankruptcy and liquidation.

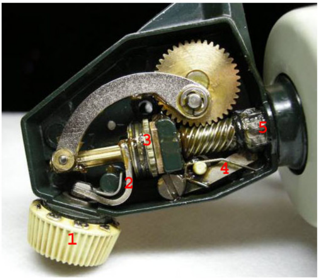
Germany's DAM (Deutsche Angelgeräte Manufaktur) picked up the worm gear concept and refined it even more, releasing their 'Quick Super' in 1954



The 'Super' had a brass main gear (1) and a steel pinion (2). Extremely powerful, but the pinion was prone to rust and corrosion, particularly in saltwater. They kept using steel and not stainless steel for their pinions up till their very last German made reel, the Quick Royal MDS (Magnetic Drag System) of 1994. Back to the 'Super', it also had a separate gear (3) with a modern type transverse cam (4) for line lay, as opposed to the simple direct cam of the Alcedo. The result was slower spool cycles, closer line coils, and increased casting distance. Now the main gear was free of cams, the winding handle could be changed to either left or right sides.

The final product was unbelievably durable that most of these reels are still in good working condition today. Mine has been used continuously by three generations since it was purchased in 1959, had the occasional bail spring and drag washer change, but the gears are still tight and ready to go for another 50 years!

Lesser important reels followed. Penn made their 704, 705, 710 and 712 spinning reels using Worm Gears drive, Hardy of England took another shot at it with the 'Exalta MKI', obscure makers from Switzerland and Italy made several forgettable reels, until the next big thing came with Abu's Cardinal circa 1965



The Cardinal could only be described as brilliant. That photo of a later Cardinal 33 shows the top engineering of that reel

1) The rear drag knob
2) Pressure cam
3) Clicker gear
4) Anti reverse dog
5) Anti reverse gear

Here we have a drag that is hidden inside the safety of the gear box away from sand and water, coupled with a groundbreaking anti-reverse: Up till that point most spinning reels had anti-reverse mechanisms that stopped the main gear. But because the pressure from the fighting fish is transferred through the rotor to the pinion, an anti-reverse that stopped the main gear put the meshing area between pinion and main gear under an undue stress. The Cardinal came with an anti-reverse that worked instead on teeth cut on the pinion, therefore taking away the potentially deforming braking load from the main & pinion gears' contact area.

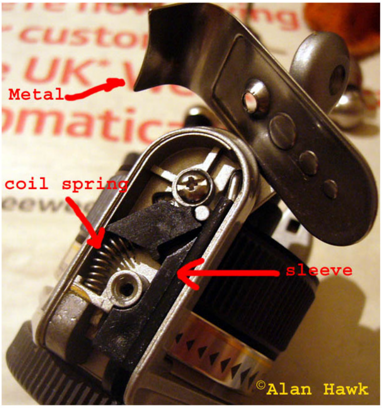
Understanding the benefits of the worm gear system is important in order to appreciate the perfection of the Suveran. That gearing is the most durable of all gearing types, and it is also the strongest because the contact area between the drive and pinion gears is approximately 3 times the contact area of bevel gears (Mitchell 488/498, Van Staal, Penn 720/722, etc), and nearly 4 times that of Hypoid gears (almost every modern spinning reel). Worm gears also run very smoothly because of their sliding action, there is no rattling and no shock waves sent through the teeth. Also very useful is the fact that gear ratios can be increased or decreased by changing the angle of the spiral teeth without the need to change the size of the gears. Their only drawback is a slight loss of efficiency compared to other gearing systems. That loss is considerable in ratios higher than 8:1, but at slower ratios (as is the case with spinning reels), the efficiency loss is negligible.

Disassembling the Suveran

The Suveran's bail arm is metal. Very admirable for such a small reel when many larger all-metal reels have plastic bail arms. At that point I started thinking that this reel might in fact be able to handle bigger fish than other reels in its size class. In hindsight, my assumption was correct.

The line roller is wide and braid friendly, and surprisingly, I found a tiny ball bearing inside it. Do not try to remove it because it is press fitted inside the roller and won't come out unless damaged. This is why the bearing does not appear in the exploded diagram, as it is an integral part of the roller. This seemingly insignificant feature eliminates any axial play in the line roller. Other makers are forced to place two bearings inside the roller to achieve that. This is the first clever engineering feature I found on this reel. Start counting because there are more unique engineering features in this reel than in any other that I have seen.

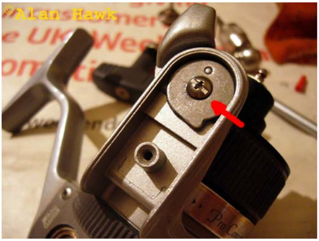
Bail mechanism



The curved covers of the bail mechanism are metal. Metal is very hard to fit around curved areas, therefore most makers who use metal for this part use a straight strip, and others just give up and make it in plastic. Shimano Stella and Daiwa Saltiga are two of those world class all metal reels that use plastic to make this cover. This is how hard it is to fit metal around curves, but Abu Garcia went for metal sparing nothing on this beautiful reel.

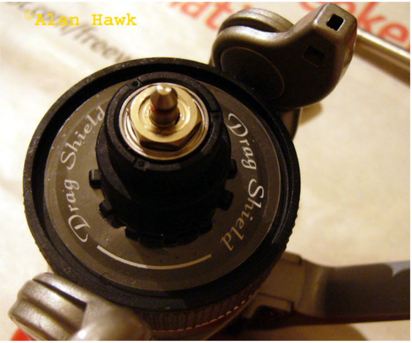
Still in the above photo, there is a sleeve covering the metal bail trip cam. The reel would work perfectly without it, but with it, opening the bail is a silent and positive feeling operation. The spring is a long life coil one. You know of course what happens to the regular wire springs and how often they break and wear out. Not exactly a world first, but at the time the Suveran was made, only very expensive top of the tree reels had coil springs such as Team Daiwa TDX HIA and TDZ.

Opposite side



The other arm of the rotor. Pointed is the counter weight installed to eliminate rotor wobble. At that time computer balanced rotors were still years away, and most makers put a large lead weight right under the spool. In the Suveran it's elegantly hidden, and it double tasks as a bail stop because of that small claw at its bottom. Keeping count of the brilliant engineering features?

Moving on to disassembling the body, the reel proved to be so different I had to stop and think for a while before I proceed on several occasions. The reel is not complicated, but very unique that I had to look at the parts diagram many times, and it took me longer than I expected to complete the job. Looking at a reel's diagram in order to disassemble is something I have not done since I was 12!



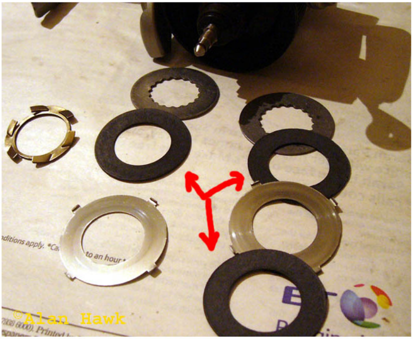
Underneath the spool lies the hub and a 'drag shield'. Not sure what it is supposed to shield against, but it's there anyway. Just don't get a false sense of security and expose it to dirt or water splashes because that shield is not going to stop either.

The drag runs on a nice quality ball bearing. Again, at that time only obscenely expensive Shimanos and Daiwas had ball bearing drags. The bearing fits the hub perfectly tight, exhibiting a close manufacturing tolerance

Shield
©Alan Hawk

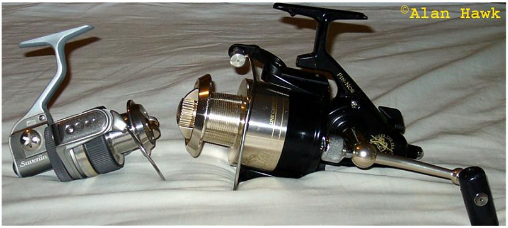
In general, the ball bearings used in the Suveran are of a very high quality. I would not be surprised if they turn out to be German made bearings. The tolerance of the ball races is extremely tight and axial play is minimal. If I had to make a guess, I'd say those bearings are ISO Class 4 or higher.

The drag washers

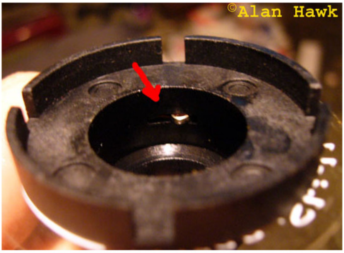


These washers are made of Carbon. Those large carbon washers dissipate heat quickly and won't change the drag setting from overheating during a fight. I am not aware of any other reel that used carbon as a drag material prior to the Suveran, but I know that later, Shimano & Daiwa decided that Carbon is superior to anything else and used it on their high end reels, something they still do to this day. Is it getting clearer now why I called it the most ingenious reel ever made?

Suveran's drag is the biggest used in a spinner in relation to a reel's size

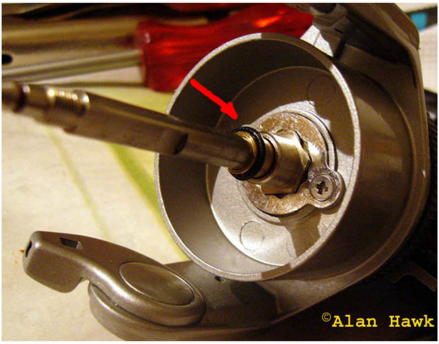


To demonstrate the drag's size, I took out the drag of a massive reel that has "Drag" as an integral part of the model's name: Fin-Nor Ahab Mega Drag #20. The net surface area of a single washer from the Suveran was exactly 942 mm squared, while the Mega Drag's washer measured 1495 mm squared. It means that the Suveran's drag is 63% the area of the Ahab's drag, even though the Ahab weighs more than twice the Suveran, and its spool alone is nearly as big as the entire Suveran!



Took me a while to locate, but here is the nifty little drag clicker.

Another refining touch

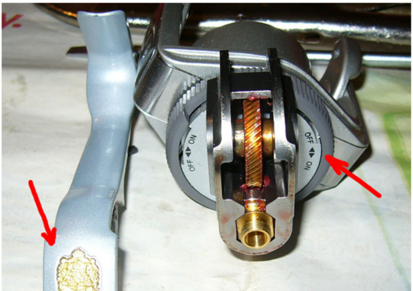


A rubber ring that goes through a machined slot in the pinion, and keeps the main shaft pulled against the inside of the pinion. Less shakiness and quieter winding, and again, something the reel wouldn't have suffered without, but that's the kind of classy touch that sets the Suveran apart.

The main shaft is non-magnetic stainless steel. Non magnetic steel indicates a higher quality and more costly structure. That steel also resists corrosion and wear better due to the amount of Chromium and Nickel in it. If you have a stainless steel Rolex watch, its case and bracelet will not attract a magnet if you try. That is top quality expensive non-magnetic stainless steel. Haven't I told you they spared nothing making the Suveran?

Also visible in the above photo is a multi position lock to keep the rotor's nut from getting loose. Much nicer and easier to install than a simple screw that requires you to align a broad side of the nut with it.

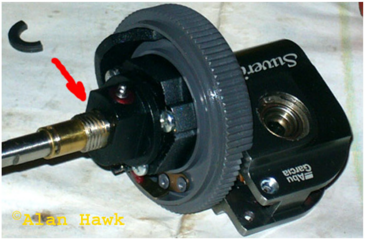
The gearbox before I took it apart



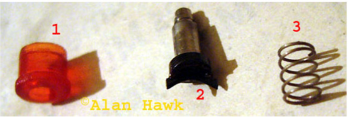
How many reel makers you know of hold a real Royal Warrant from a real King? This kind of charm is exclusive to Abu-Garcia.

The other arrow points to the large disc that switches the anti-reverse on and off. The text on it tells you which way does what. The position of the switch few millimeters from the center drag disc makes it easy to switch the anti-reverse on/off at the same time your other finger is adjusting the drag during a fight.

Oscillation

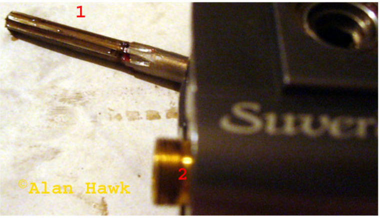


This bit is #3 of my top 3 engineering breakthroughs in the Suveran. It is a fact that worm gear oscillation offers the best line lay on a spinning reel. The stroke could be as long as the maker wants, the line lays in close coils, and the cycle rate could be easily controlled during manufacturing. Yet it requires many parts, special housings, two extra gears, and an enlarged gear box to house all of these. Abu engineers started with a white sheet and managed to do it with just 4 very effective parts. Incredible if we know that in Shimano Stella it requires 19 parts to do the same job, and we are talking about the simplified 2008 model. The older Stella needed 26 parts to do it!!

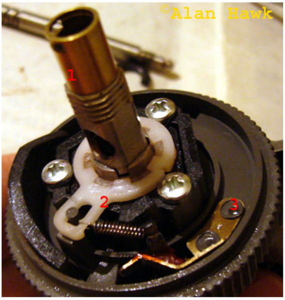


Instead of an extra gear and several bushings to generate motion, they fixed the unit (red arrow) to the revolving rotor, using its motion. And instead of a separate oscillation shaft and its many supporting parts, they machined the grooves right into the main shaft. The unit has only a bearing (1), a pawl (2), and a tiny spring (3). A total of 4 parts doing the job perfectly leaving the gear box as small and compact as possible.

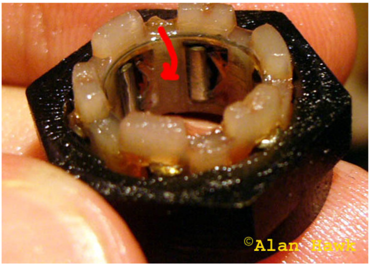
The sophistication continues



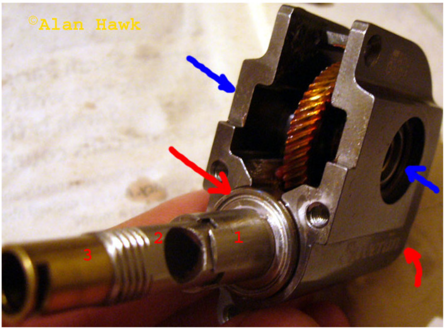
The main shaft (1) is fluted on the rear and goes through an internally fluted brass nut (2) at the end of the gear box to stop the shaft from rotating under heavy loads. I can think of at least 10 ways to do it cheaper and simpler, but Abu seemes to have chosen quality engineering and refinement over simplicity and cost effectiveness. Exactly the same mentality employed in building a luxurious Swiss watch.



They could have left the pinion alone and it would've been alright, but they opted to insert a brass tube (1) inside the pinion to provide smoother action and protect the shaft from wear. Also seen is the instant anti-reverse actuator (2), and the anti-reverse switch's spring (3).



A closeup of the one way clutch showing the little V shaped springs that keep the steel cylinders in the locked position. There is another type of clutches which uses no springs and would live longer, but it gives a slight back play before it locks. I personally prefer the positive lock and complexity of the spring type clutches.



In every spinning reel I've laid my hands on, the pinion was just a single piece of metal, regardless of the configuration, size, or price. The Suveran's pinion is composed of 3 layers. The first is a very tough and wear resistant stainless steel layer (2) that has the teeth which mesh with the drive gear. A second layer (1) is a lightweight tube that has the bearing stop on one side and works as a sleeve for the one way clutch on the other side. And finally, a third layer (3) which is a brass tube bedding for the shaft as described earlier. A pinion that has more work on it than many complete reels illustrates what the Suveran concept is all about: Absolute refinement.

Still in the above photo, the two red arrows point to the two ball bearings that the pinion runs on (only one bearing is visible from this angle), and the blue arrows point to the bearings of the drive gear (also only 1 visible). The bearings are of the same top quality described earlier.

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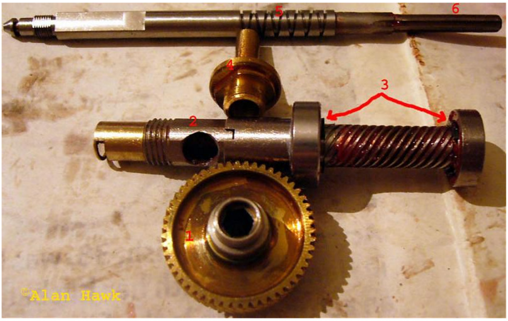
Abu Garcia

The drive gear is mounted on two bearings, one on each side, and those bearings are kept in place by that elegant retainer in a bullet proof yet simple setup. And I know I'm repeating myself, but pushing the bearing down the housing is an absolute pleasure due to the tight tolerance. The housing just hugs the bearing with no play what so ever, yet you don't have to push hard on it to on its way down. Unbelievable precision!

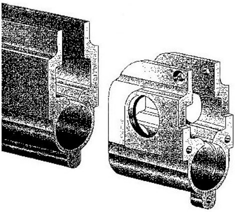
The entire drivetrain



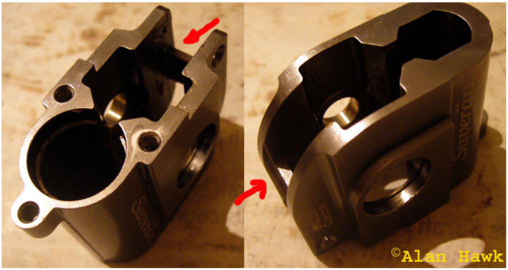
1) Main Gear, we'll get to it shortly.
2) The multi layer pinion with a ball bearing at each end.
3) The arrows point to the two slim retainers holding the bearings in place.
4) The internally fluted nut that keeps the shaft from rotating.
5) The worm oscillation grooves.
6) The fluted part of the shaft.

As you can see the amount of machining work on the main shaft is as impressive as the construction of the pinion discussed earlier.

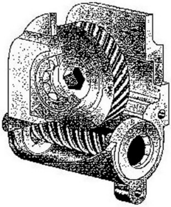
Now we have reached my #2 favorite engineering feature of the top 3 in this reel: The main body..



They started with a solid forging of 6061-T6 aluminum alloy, then they made the frame out of it through Extrusion. This is a way of forming metals that involves pressing the raw forging through a die to its desired shape. Unlike casting, the part keeps its molecular integrity, and unlike machining, it becomes very dense and its surfaces are left with a shiny finish and a natural resistance to corrosion. Image above is a sketch from a set that was released in Sweden during the initial marketing of the Suveran, showing the formation of the body through extrusion.

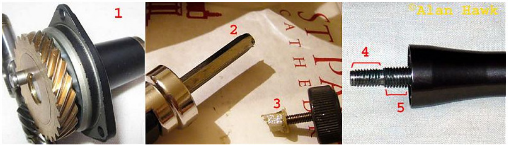


After extrusion, the body is machined to create screw threads, bearings recesses, and to cut out the top leaving only the bridge pointed by red arrows. That bridge, an integral part of the body, is what makes this gear box virtually indestructible. There are no side covers to crack open when the gears are under massive pressure, and the only way gears could disengage is to somehow tear apart the 44000 lbs/sq.in strong one piece frame.



Another sketch showing the pinion and drive gear housed securely inside the one piece body, each is mounted on two ball bearings. For the past five years I've been describing this as "the strongest gear box ever used on a spinning reel", and I am yet to see anything that could change my mind.

If the genius four pieces oscillation was my #3 favorite feature, and the powerful gear box was my #2 favorite feature, my #1 is quite justly my favorite engineering feature of any reel, not just the Suveran: When I check out a reel, one of the first things I examine is how the handle is attached to the drive gear. In reels with ambidextrous handles, a strong and reliable mechanism is required to secure the handle to the gear on either side, leaving no play. There are generally three types of such mechanisms.

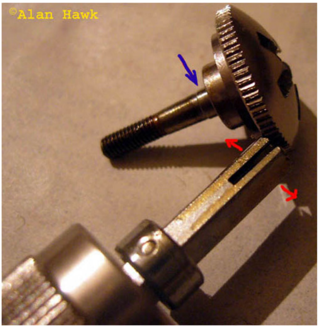


First system is shown on the left in the above image (1), where the drive gear is permanently fixed to the handle's axle. This is, naturally, the strongest and most secure method, but changing the handle to the other side requires taking out the gear and a part of the body, and tools must be used.

Second system is in the centre, where the handle's axle (2) is hexagonal, and it goes through a similarly shaped female shaft in the main gear, then gets secured on the other side by a screw. Sometimes the screw will have a small pointed bushing (3) that gets wedged between the axle and the inner wall of the gear's shaft to prevent play. A user friendly system, but it puts parts under immense stress. The screw's head is tightened against the gear's shaft, the bushing is squashed between the gear's wall and the handle's axle, and quite often the screw would get loose and needs re-tightening. But the biggest disadvantage of this system is that the main gear (or at least its shaft), must be made of cast aluminum in order for the female hexagonal shaft to be formed. And a cast aluminum gear (or gear's shaft), automatically puts the reel down the chain in terms of quality.

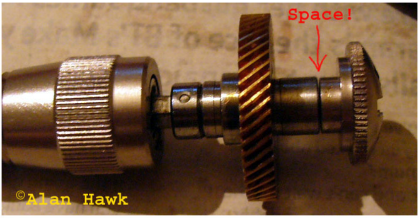
Third system is shown on the right in the above image, where the handle's axle is screwed into the gear. The handle will have two sets of threads, one is counter-clockwise to be secured to the left side (5), and another, clockwise, to be secured to the right side of the reel (4). This system eliminates play, but it has an inherent weakness which is that one of the threaded parts must be thinner than the other, meaning that it will be weaker, and each set of threads is limited to half the length of the axle only.

What about the Suveran?

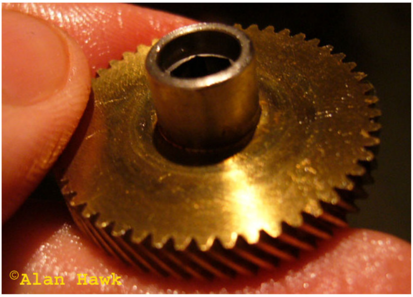


The Suveran adopts the second system, the hexagonal axle, but only after they redesigned it to eliminate the disadvantages and create new advantages for it! What they did was that they split the axle's tip into two halves, then they machined the securing screw so that it would have a part near the end that is larger in diameter than the rest of the screw. That thicker part is pointed to by the blue arrow.

When the handle is attached and the screw is tightened, that fat part at the end forces the two halves of the axle apart in the directions pointed to by the red arrows. And when the axle is forced to split, it fills the slightest clearance between itself and the female shaft achieving a perfect attachement that rivals that of the first system, where the gear is permanently attached to the handle's axle.

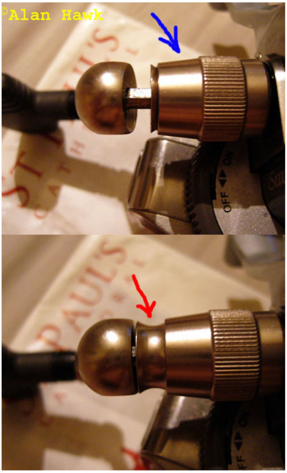


To demonstrate that, I attached the gear to the handle and tightened the screw without much force, and the result could be seen in this photo: the handle's axle is perfectly attached, yet there is still a space left between the screw's head and the gear's shaft. The screw's head is not touching anything, thus is under no pressure as in regular systems. There is zero play, and that lack of play added to the fact that the screw's head is not in contact with anything, keep the system secure with no chances of it getting loose. It is not about stressing parts against each other, but rather changing the diameter of the split axle to fill any clearance inside the gear's shaft, making it virtually an integral part of it. And this, gentleman, is genius creativity and top notch engineering in action.



The gear's shaft, which contains the female hexagonal tunnel, was not made from cast aluminum. Rather they managed to somehow make it from the same expensive non-magnetic stainless steel (I'd imagine through cold forging), then embed it into the heavily machined brass main gear.

A final touch of destination



Like many other reels, the Suveran's handle is collapsible for transportation & storage. In other reels, a nut on the axle is turned in order for it to move to the left along the axle until it locks the handle in the fishing position. But, as many might have experienced, with use, the nut gets loose and the handle starts to shake and you need to tighten it again. The makers of the Suveran did not follow the herd, they did put a nut on the axle (blue arrow), but the nut itself does not move left to lock the handle. When you turn it, a neat pressure disc emerges from inside the nut (red arrow) and keeps extending until it secures the handle in the fishing position.

That by itself is elegant enough to be considered a unique feature. But the real advantage here is that the pressure disk does not rotate, and you can't turn it if you try. It is designed to only extend outwards without revolving. Accordingly, and because the part that touches the handle can not rotate, the system will never get loose or need re-tightening no mater what you do with the handle. Just like that, every single part of this reel is perfectly designed it hardly has anything in common with spinning reels as we know them.

Right side view of the reel, reassembled and ready to make me as sad as it has been making me for the past few years.......

©Alan Hawk
Suveran
Command Mag

Why sad, you ask? Because it's over. There will be no more such quality coming out of Sweden, where Abu truly belongs. I have no idea why this happened. Was it because they made reels that could serve the owner for 50 years and people did not have to buy more? Could it be because we, consumers, became used to cheap generic stuff that has no character what so ever? I might never know, but I know that every time I use the Suveran I'll feel sad thinking about what could have been. Had they made them in larger sizes with minor modifications to handle saltwater, the USD $1000 Shimano Stalla would be struggling to catch up with Abu Garcia Suveran 8000M. Had they kept developing them using that same ingenuity, I can only imagine how breathtaking the 2008 Suveran could have been.....

Even if Abu resumed making them in their Chinese factory, it will never be the same. The romance, nostalgia, and history associated with Swedish designed and built reels is nothing all the advanced machines in the world can restore.

MADE IN SWEDEN 01
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My only conciliation is that that golden era ended with not just any reel, but with what undoubtedly is the finest spinning reel ever built. At least in my book.

Alan Hawk
November, 2008