Easier to understand summary of some of the features:

Make a simpler version of this connector that works almost exactly like a USB-C port, but the insertion force is zero (or negative, if a magnet is included) and the pull out force can be much higher.

A similar concept can be applied to a connector much more similar to USB type C, with a more flexible spring for insertion, and when the user pulls out the connector, a different spring with a much higher spring ratio is used.

To help with the durability of the female connector over the male connector, the spring mechanism is in the male connector, so the male connector could last, say, 2,000 insertions, but the female connector should be good for 10x or even 100x as many. This is important because the female connector is usually something that is much more costly to replace (e.g., a phone or laptop) than the male connector (e.g., usually a charging cable or flash drive)

Smartphones and laptops can charge on special USB like chargers, but instead of delivering a constant fixed voltage e.g., 12V or 5V, these chargers would provide the exact voltage needed for the battery, eliminating the need for a larger power circutry on the phone or laptop itself, reducing weight and complexity, and increasing reliability.

(prior art: Tesla electric cars already use a similar system to recharge their batteries at Supercharger stations)for the connector case, we want to make sure that both the female and male connector won’t have any delicate or sharp parts sticking out of it that would be fragile or dangerous for the user

A further improvement is being able to support one or more fiber optic links in the future. To help dust and dirt resistance on the fiber optic links, we can place the optics connections parallel to the insertion direction, creating a “wiping effect” so that whenever the user plugs in the fiber optic cable, the connector wipes any dirt or dust off the fiber optic connection(s).

We can make a more dust-resistant version using elastomers instead of metal springs. Of course, most elastomers such as rubber and silicone might slowly deform under load over the 5 year lifespan of a phone or computer, so this would definitely be limited to using it on the male end of the connectors

Another improvement would be that there are two different types of female connectors: one for laptops where an emergency disconnection would be useful (e.g., Apple Magsafe and other charging connections), and another where a more traditional connection process is used, i.e., where the connector can only be released if the user pulls out the plug (i.e., like a traditional USB – C port), like a flash drive

This can be achieved in making the female connector on phones or flash drives much deeper so that it does not get accidentally disconnected easily

Also, a phone could connect to a USB C charger and, by asking the charger to provide the exact voltage that the battery pack is at, the electricity would flow straight from the switched mode power supply from the USB C charger brick to the phone’s battery (e.g., 3.0 volts, to 4.3 volts, so the phone doesn’t need to use it’s internal built-in switched mode power supply, which would also reduce the amount of heat generated from charging the battery.

The phone battery can also be in a series configuration with multiple cells inside, so the power brick can send 15 to 23.5 volts to the phone with a 5S battery pack (and same with laptops). This would have the advantage of being able to make a phone or laptop that would charge very fast, while decreasing the size of the switched mode power supply located inside the phone or laptop. The phone or laptop would also heat up less while charging as the electricity is going directly to the battery pack without any heat-producing switching circuitry in the phone or laptop.

Also, we can have the moving parts on the male connector and also add another ring around that side so that the moving parts don’t get exposed as much, so they would be less likely to be damaged or caught on fabrics or something.

The existing USB type C protocol that supports 66 watt charging requires a 66 watt voltage converter inside the charger brick, as well as a 66 watt voltage converter in the smartphone.

By using this new idea, the power brick would be pretty much the same in cost as an existing USB type C charging brick, as the voltage converter is already capable of outputting various voltages down to millivolt precision. The smartphone wouldn’t need a 66 watt voltage converter with this idea, but only a 7 watt voltage converter or so which would be used to power the phone’s CPU, display, 5G radio, etc.

Also, this improved protocol would also decrease the amount of heat that the smartphone generates when charging quickly, which allows the device to be charged even faster without degrading the battery too quickly. One or more thermometers next to the battery can also help battery safety while fast charging, by reducing the charging speed if the temperature is too high

2. This invention is implemented by either having the smartphone or laptop communicate to a microprocessor in the USB charger brick via USB 3.0 to tell it what voltage and current it needs, and the microprocessor that controls the Switched Mode Power Supply in the charger brick changes the resistance in the resistor (maybe a photoresistor or something) that normally is used to fine tune the output voltage.

Of a simpler method is to just have the power brick have the same internal circuitry as a normal 18650 lithium ion charger, outputting 5 amps or so, stopping at 4.2 volts per “S”

We can also consider requiring USB cables that use insulation that can withstand 200 degrees Celsius to allow higher amounts of amps that can be safely transferred.

Although it is true that this probably won’t make charging better on current smartphones, this could benefit future smartphones or laptops if they put multiple lithium ion battery cells in series, so that the battery pack have a voltage (for example) of 8 x 3.0 volts (24 volts) to 8 x 4.2 volts (33.6 volts).

We can use the moving springs on the cable and the part that does not have moving parts on the phone/laptop/power brick. Furthermore, we can use a somewhat thin metal shroud around the moving parts to protect them.

Basically, this invention describes the ability for the phone or laptop to use a battery pack of multiple identical lithium ion batteries in series, so that the charger can output, for example, 12 – 16.8 volts for a battery pack containing 4 batteries in series with each cell operating between 3.0 – 4.2 volts