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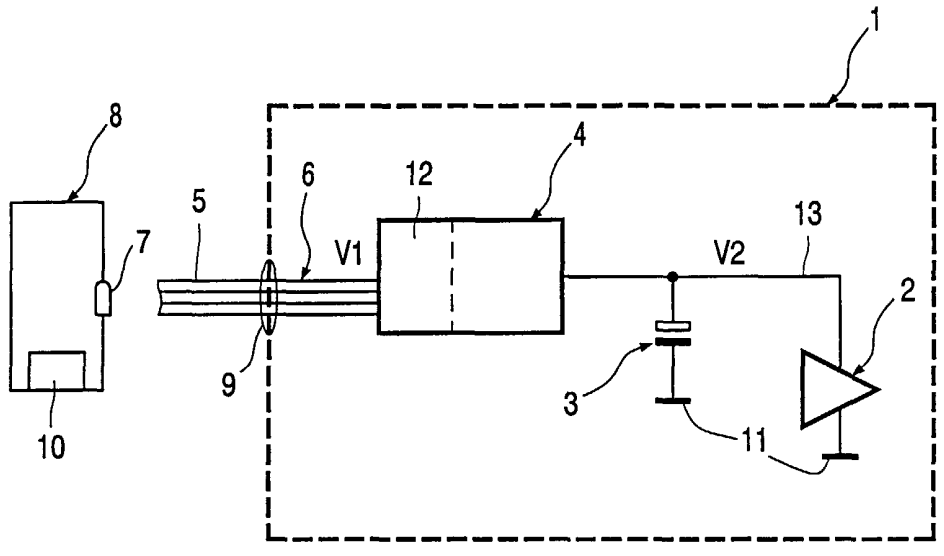
(54) Title: DEVICE



(57) Abstract: The invention relates to a device (2) which can be supplied with a given DC voltage (V1) and with a current of limited strength via a supply line (5). According to the invention, a capacitor (3) is connected to an input (15) of the device (2).

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Device

The invention relates to a device which can be supplied with a given DC voltage and with a current of limited strength via a supply line.

Such a device operates as a peripheral device in dependence on a control device. The two devices are interconnected by a multicore capable through which data are transmitted universally and serially, referred to as Universal Serial Bus or USB for short. The control device has a power supply part and is accordingly cable also of supplying the peripheral device with current via the multicore cable. The power supply part has a given output voltage and is capable of delivering a maximum output current level, i.e. the current is limited as to its strength. If a peripheral device is supplied with power through the cable and if it exhibits a fluctuating current consumption, then the average current consumption will be lower than the maximum possible current consumption. Consequently, the maximum possible power made available by the power supply part is not fully utilized.

It is an object of the invention to increase the average power consumption of a peripheral device supplied with current by the energy supply part without exceeding the maximum admissible current level.

The invention achieves this object by means of the characteristics of claim 1. According to the invention, a capacitor is connected to the input of the device. The principle is that energy is put into intermediate storage in the capacitor during those time periods in which the peripheral device requires less than the maximum possible power. The power of the peripheral device can be increased in this manner.

Advantageously, a DC-DC converter is connected upstream of the storage capacitor. The DC-DC converter converts the voltage V1 applied to the supply connection to a higher voltage V2. Whenever the consumption of the peripheral device exceeds the maximum possible power level, the storage capacitor will make good the deficit. The voltage at the storage capacitor will drop. The moment the consumption of the peripheral device

drops and the supply connection makes more electric power available than is required by the peripheral device, the DC-DC converter will branch off the excess energy into the capacitor. The storage capacitor is charged again until the higher voltage V2 is achieved. By this method, current consumption peaks of the peripheral device can be higher than the maximum possible power level, while the maximum possible power made available by the power supply will never exceed the maximum. Peripheral devices which usually operate at higher voltage levels can now be used because of the higher voltage values.

Advantageously, a current limiter is connected to the input. If more power is used than the power supply part is capable of delivering, the power supply part could become damaged by an overload, or it may be switched off by a safety cut-out mechanism. The current limiter at the input of the DC-DC converter limits the input current and prevents damage to the power supply part or triggering of the cut-out mechanism.

For better understanding, an embodiment of the invention will now be explained in more detail below with reference to the drawing, in which

Fig. 1 shows a peripheral device with a current supply connection.

Fig. 1 is a block diagram of a circuit 1 with a peripheral device 2, also referred to as load hereinafter, with a capacitor 3 and a DC-DC converter 4. The DC-DC converter 4 is connected to a supply terminal 7 of a personal computer 8 by means of a supply line 5 inside a four-core cable 6. The supply terminal 7 is denoted the upstream port, an input 9 of the peripheral device 1 the downstream port. The computer 8 has a power supply part 10 which at a given DC voltage will supply a given maximum current. Instead of the computer 8, the peripheral device 1 may also be connected to a monitor, which also has a power supply part and operates as a USB distributor. The power supply part 10 may be constructed as a mains power part or as a supply part which derives its energy from batteries. A first voltage V1 is applied to the line 5. A current limited in its strength is supplied to the DC-DC converter 4 via the supply line 5. The DC-DC converter 4, also denoted upconverter, comprises a choke coil and the capacitor 3, which are connected in series. Between the choke coil and the capacitor 3 there is a switch which may either close the circuit or be connected to a ground connection 11. The DC-DC converter 4 comprises a current limiter 12 in an input region. The current limiter 12 prevents more than a maximum admissible current Imax from being derived from the supply unit 10. This means that a maximum power Pmax can be

calculated from the product of Imax and the voltage V1. The DC-DC converter 4 converts the voltage V1 applied to the supply line 5 to a higher voltage V2 and supplies the load 2 and the capacitor 3 with current. The capacitor 3 and the load 2 are connected in parallel and are continuously supplied with power. If the consumption of the load 2 shows a strong fluctuation, the capacitor 3 is charged whenever the consumption of the load 2 lies below the maximum possible power Pmax. If the load 2 requires more power than the supply line 5 is capable of delivering to the peripheral device 1, the capacitor 3 can supply this additional power for a short period. This means that the load 2 is capable of achieving a power lying above Pmax for a short period. This short power increase takes place in power peaks which are typically generated by audio amplifiers in the musical range. It is true that the voltage V2 across the capacitor 3, and thus on the line 13, drops during the supply of power from the capacitor, but this short-period voltage drop does not lead to additional power being required over and above the maximum possible power from the supply unit 10, whereby the supply unit 10 would be destroyed. The line 13 connects an output 14 of the DC-DC converter 4 to an input 15 of the load 2 and to the capacitor 3.

List of reference numerals

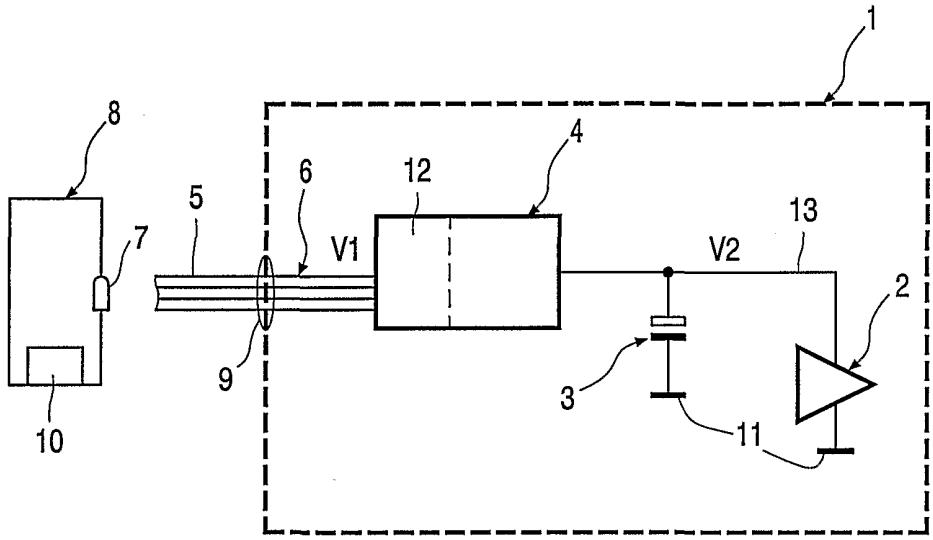
1	circuit
2	peripheral device
3	capacitor
4	DC-DC converter
5	supply line
6	cable
7	supply terminal (upstream port)
8	personal computer
9	input (downstream port)
10	power supply part
11	ground
12	current limiter
13	connection line
14	output
15	input

CLAIMS:

1. A device (2) which can be supplied with a given DC voltage (V1) and with a current of limited strength via a supply line (5), characterized in that a capacitor (3) is connected to an input (15) of the device (2).

2. A device as claimed in claim 1, characterized in that a DC-DC converter (4) is connected to the input (15).

3. A device as claimed in claim 1 and/or 2, characterized in that a current limiter (12) is connected upstream of the DC-DC converter (4).


1
8
7
10
5
6
V1
9
12
4
13
V2
2
3
11