ground.

It is also an object of the present invention to provide an energy harvesting device that is capable of providing a voltage in the region between 1 and 10 volt without using a converter to step up the voltage.

It is also an object of the present invention to provide an energy harvesting device that does not depend on current running in the cable.

Moreover, in case that a larger current is needed, it would be possible to apply several patches. However, the documents D1 and D2 do not stress this challenge or suggest how to solve the challenge.

Therefore, it is an object of the invention to provide an energy harvesting device that applies a plurality of patches.

Summary of the invention

The object of the present invention can be achieved by an energy harvesting device as defined in claim 1. Preferred embodiments are defined in the dependent sub claims and explained in the following description and illustrated in the accompanying drawings.

According to one aspect of the invention, there is provided an energy harvesting device configured to surround a portion of an electrical cable, which energy harvesting device comprises a plurality of electrically separated and electrically conducting patch members configured to be arranged in such a manner that an electric potential difference is provided between a first outlet point and a second outlet point, where the patch members are electrically connected to the first outlet point and/or to the second outlet point, where the patch members are configured to be attached on the outside, and/or in close

proximity of the electrical cable, characterised in that the energy harvesting device is configured to rectify currents from a first group of the patch members by rectifiers providing a first current direction, where the energy harvesting device is configured to rectify currents from the remaining patch members by other rectifiers providing another current direction.

In the present context, an "energy harvesting device" refers to a device, which is adapted to harvest electrical energy.

~~The energy harvesting device according to the invention is~~Also disclosed an energy harvesting device configured to surround a portion of an electrical cable. The energy harvesting device comprises a plurality of electrically separated and electrically conducting patch members configured to be arranged in such a manner that an electric potential difference is provided between a first outlet point and a second outlet point, where the patch members are electrically connected to the first outlet point and/or to the second outlet

Claims

1. An energy harvesting device ~~(2)~~ configured to surround a portion of an electrical cable ~~(4)~~, which energy harvesting device ~~(2)~~ comprises a plurality of electrically separated and electrically conducting patch members ~~(22, 22', 24, 24', 26, 26')~~ configured to be arranged in such a manner that an electric potential difference ~~(V)~~ is provided between a first outlet point ~~(B)~~ and a second outlet point ~~(A)~~, where the patch members ~~(22, 22', 24, 24', 26, 26')~~ are electrically connected to the first outlet point ~~(B)~~ and/or to the second outlet point ~~(A)~~, where the patch members ~~(22, 22', 24, 24', 26, 26')~~ are configured to be attached on the outside, and/or in close proximity of the electrical cable ~~(4)~~, **characterised in** that the energy harvesting device ~~(2)~~ is configured to rectify currents from a first group of the patch members ~~(22', 22, 24)~~ by rectifiers ~~(38, 38')~~ providing a first current direction, where the energy harvesting device ~~(2)~~ is configured to rectify currents from the remaining patch members ~~(24', 26, 26')~~ by other rectifiers ~~(39, 39')~~ providing another current direction.

2. An energy harvesting device ~~(2)~~ according to claim 1, **characterised in** that the energy harvesting device ~~(2)~~ comprises a plurality of patch members ~~(22, 22', 24, 24', 26, 26')~~ that are electrically separated by separation members ~~(28, 30)~~.

3. An energy harvesting device ~~(2)~~ according to claim 1 or claim 2, **characterised in** that the patch members ~~(22, 22', 24, 24', 26, 26')~~ are electrically connected to a rectification unit ~~(62)~~ by means of a number of connection members ~~(32, 32', 34, 34', 36, 36')~~ and that the rectification unit ~~(62)~~ comprises a plurality of rectifiers ~~(38, 38', 39, 39')~~ configured to rectify currents from the patch members ~~(22, 22', 24, 24', 26, 26')~~ in a predefined way.

4. An energy harvesting device ~~(2)~~ according to one of the preceding

claims, **characterised in** that the energy harvesting device ~~(2)~~ is configured to rectify all current from the patch members ~~(22, 22', 24, 24', 26, 26')~~ so that the current is directed towards the same first outlet point ~~(B)~~ and hereby build up a potential difference between the first outlet point ~~(B)~~ and the second outlet point ~~(A)~~.

5. An energy harvesting device ~~(2)~~ according to claim 4, **characterised in** that the patch members ~~(22, 22', 24, 24', 26, 26')~~ are electrically connected to a rectification unit ~~(62)~~ by means of a number of connection members ~~(e.g. wires) (32, 32', 34, 34', 36, 36')~~.

6. An energy harvesting device ~~(2)~~ according to claim 4 or 5, **characterised in** that each patch member ~~(22, 22', 24, 24', 26, 26')~~ is ~~(directly)~~ electrically connected to a first rectifier ~~(38, 39)~~ configured to rectify the current from the patch member ~~(22, 22', 24, 24', 26, 26')~~ in one direction and to a second rectifier ~~(38', 39')~~ configured to rectify the current from the patch member ~~(22, 22', 24, 24', 26, 26')~~ in the opposite direction.

7. An energy harvesting device ~~(2)~~ according to claim 4, **characterised in** that the rectification unit ~~(62)~~ is provided with a plurality of rectifiers ~~(38, 38')~~ adapted to rectify alternating current from the patch members ~~(22, 22', 24, 24', 26, 26')~~ in one predefined direction.

8. An energy harvesting device ~~(2)~~ according to one of the claims 4-7, **characterised in** that the current from each of the patch members ~~(22', 22, 24, 24', 26', 26')~~ is conducted through a connection member ~~(a wire 40')~~ and further through a first main connector ~~(44)~~ electrically connected to a first outlet point ~~(A)~~.

9. An energy harvesting device ~~(2)~~ according to one of the claims 4-8, **characterised in** that the current from each of the patch members

~~(22', 22, 24, 24', 26', 26')~~ is conducted through a connection member ~~(a wire 40)~~ and further through a second main connector ~~(46)~~ electrically connected to a second outlet point ~~(B)~~.

10. An energy harvesting device ~~(2)~~ according to one of the preceding claims 5-9, **characterised in** that the rectification unit ~~(62)~~ comprises an energy storage ~~(C)~~.

11. An energy harvesting device ~~(2)~~ according to claim 10, **characterised in** that the energy storage ~~(C)~~ is a capacitor and/or a battery.

12. An energy harvesting device ~~(2)~~ according to one of the preceding claims, **characterised in** that the patch members ~~(22, 22', 24, 24', 26, 26')~~ are configured to be wrapped in multiple layers around the cable ~~(4)~~.

13. An energy harvesting device ~~(2)~~ according to one of the preceding claims, **characterised in** that the energy harvesting device ~~(2)~~ comprises several separate modules ~~(48, 50, 52)~~ each configured to harvest electrical energy, where the modules ~~(48, 50, 52)~~ comprise means ~~(54, 56, 62, 64)~~ for electrically connecting the modules ~~(48, 50, 52)~~ to each other.