

Description

Device for contactless transmission of data to mobile data carriers with protection against too close an approach

5 It is usual in identification technology to transmit data between a generally fixed read-write unit and mobile data memories in a contactless fashion in an inductive way. The read-write unit builds up a radio-frequency electromagnetic field for this purpose. Said
10 field is used through suitable modulation, on the one hand, for transmitting data to the mobile data carrier or for receiving data from the mobile data carrier. On the other hand, the field also transmits a great deal of electrical energy inductively to a mobile data carrier,
15 in order to put the latter, at least temporarily, into a state ready to transmit or receive. It is then possible to dispense with a separate power supply for the mobile data carrier, for example a battery.

 In order to permit such transmissions of data and
20 energy from a read-write unit to a mobile data memory in a contactless fashion, it is at least necessary for the mobile data memory to be brought via a sufficient approach into the transmitting and receiving region of the read-write unit, that is to say the radio-frequency
25 induction field thereof.

 Problems can arise in this case if the mobile data memory has to be handled by a person in the form of an identity card for example, or is fastened to his/her clothing. Such applications occur, for example, in the
30 case of mobile data memories which are used, for example, to permit automatic contactless access of people, for example, to facilities of suburban public transport, leisure facilities and many more. These people can include individuals in whose body a medical implant such
35 as, for example, a pacemaker, an insulin pump or the like is inserted.

It cannot be entirely ruled out that radio-frequency alternating electromagnetic fields emitted by contactless identification devices of the above type will cause undesired impairment of the operation of the implanted
5 appliance in the event of a person with an implant approaching too close to a read-write unit.

It is therefore the object of the invention to design such a device for contactless transmission of data and, if appropriate, also energy to mobile data carriers
10 so as to prevent people with medical implants from approaching in a possibly dangerous way.

The object is achieved by means of the device specified in claim 1. Advantageous further embodiments of the invention are contained in the subclaims.

15 The invention is explained in more detail using the examples represented in the figures, which are set forth briefly below, and in which:

Figure 1 shows a first design for a device, configured according to the invention in the form of a housing and having spacing means configured
20 like bows,

Figure 2 shows a second design for a device configured according to the invention in the form of a housing and having spacing means configured
25 in the shape of longitudinal wedges or screens,

Figure 3 shows a third design for a device configured according to the invention in a form recessed on a surrounding holding surface and with
30 spacing means of bow-like configuration,

Figure 4 shows a fourth design for a device configured according to the invention in a form recessed in a surrounding holding surface and with spacing means configured in the form of troughs, and

Figure 5 shows a fifth design for a device configured according to the invention with spacing means configured in the form of, for example, two raised portions.

10 In accordance with the representation in Figure 1, the device serves for contactless transmission of data and, if appropriate, energy to a, for example, mobile data carrier 15 via an electromagnetic field. In this case, the data carrier can have the form of a chip card which, for the purpose of enabling transmission of data and, if appropriate, also energy, has to be brought into the spatial vicinity of the transmitting device. In the example of Figure 1, the latter is accommodated in a separate housing 9. An antenna 3 for emitting data to and/or receiving data from the exemplary mobile data carrier 15 is preferably located in the region of the front side of the housing. An antenna field area 1 serves at least to cover the antenna 3, which is preferably laminated in sealing compound and fitted on the rear side of the antenna field area, and for this reason is represented in Figure 1 by a dashed line.

20 According to the invention, the device has spacing means 5, 7, which are located at at least one edge region 17 and/or 19 of the antenna field area 1 and configured so as to prevent areas of the trunk of, in particular, human bodies, in particular parts of the chest, back and pelvis, from approaching too close to the antenna field area 1. The clear width of the antenna field area 1 is thus designed approximately such that a mobile data carrier 1 can be brought by a person, for example using a hand, into the immediate spatial vicinity of the antenna field area 1,

that is to say into the space between the spacing means 5, 7, which in the example of Figure 1 are fitted in pairs and opposite one another.

On the other hand, however, the spacing means
5 fitted in the region of one or more edge regions around
the antenna field area can specifically prevent large-
area parts, in particular of a human body, for example
areas of the chest, back and pelvis, from inadvertently
and unintentionally coming under certain circumstances
10 into direct contact with the antenna field area and
thereby at least not excluding malfunctioning of
implanted appliances. In particular, in cases when a
housing-like read-write device, for example according to
Figure 1, is fitted in an easily accessible fashion for
15 the purpose of accepting units of value in areas fre-
quented by many people, for example in the interior of
means of transport such as buses and trains, because of
vibrations and crowds of people it cannot be excluded
that a person will bump against the antenna field area.
20 In particular, in such a case the spacing means according
to the invention must prevent an impermissibly close
approach of sensitive parts of the body to the antenna
field area.

In the example represented in Figure 1, the
25 spacing means are configured in the form of two bows 5,
7, which are arranged at two opposite vertical side edges
17, 19 of the antenna field area 1, that is to say, in
particular, at the vertical edges of the housing. If
required, it is also possible to arrange additional
30 spacing bows at the two opposite horizontal side edges
21, 23 of the antenna field area, that is to say, in
particular, at the transverse edges of the housing.

In another design, the spacing means 5, 7 can
also be configured in the form of at least one longi-
35 tudinal wedge or a screen. In the example represented in
Figure 2, the spacing means are arranged as side walls 5,
7 at two opposite sides 17, 19 of the antenna field area.

In the example represented in Figure 3, the antenna field area 1 with the antenna 3 situated therebehind is preferably recessed flush in a surrounding holding surface 11. This can be, for example, an inner wall or outer wall of a space or building. The antenna field area 1 is then preferably recessed into the holding surface approximately at the level from the floor of the hip or chest of a person of average height. The spacing means are configured once again like bows in Figure 3.

Finally, in the example represented in Figure 4 the spacing means are configured in the form of a trough 13 holding the antenna field area 1. The trough floor is formed by the antenna field area 1. The trough can be of dish-shaped or oval configuration, and is recessed in a surrounding holding surface 11 or a part thereof.

In a further exemplary embodiment, represented in Figure 5, the spacing means are configured in the form of at least one raised portion which is arranged at at least one edge region of the antenna field area 1. The raised portion can be constructed in this case in the form of a hump or spine, for example. The raised portion can also be a component of a cover or control panel of a neighboring appliance, or can be connected to or integrated in the latter. As already represented in Figure 5, the spacing means are advantageously configured in the form of two raised portions 25, 27 which run at opposite edge regions 17, 19 of the antenna field area 1 along a, for example, horizontal line of alignment or symmetry 29.



Patent Claims

1. A device for contactless transmission at least of data to mobile data carriers (15), in particular chip cards, via an electromagnetic field, having
 - 5 a) an antenna (3) for emitting data to and/or receiving data from the mobile data carriers (15),
 - b) an antenna field area (1) at least for covering the antenna (3), and having
 - 10 c) spacing means (5, 7), which are located at at least one edge region of the antenna field area (1) and configured so as to prevent areas of the trunk of, in particular, human bodies, in particular parts of the chest, back and pelvis, from approaching too close to the antenna field area (1).
- 15 2. The device as claimed in claim 1, the spacing means (5, 7) being configured in the form of at least one bow.
3. The device as claimed in claim 1, the spacing means (5, 7) being configured in the form of at least one
20 longitudinal wedge or a screen.
4. The device as claimed in one of the preceding claims, the spacing means (5, 7) being arranged at least at two opposite side edges (17, 19) of the antenna field area (1).
- 25 5. The device as claimed in claim 1, the spacing means (5, 7) being configured in the form of a trough (13) holding the antenna field area (1).



6. The device as claimed in claim 1, the spacing means (5, 7) being configured in the form of at least one raised portion (25, 27) at at least one edge region of the antenna field area (1).

- 5 7. The device as claimed in claim 6, the spacing means being configured in the form of two raised portions (25, 27) which run at opposite edge regions (17, 19) of the antenna field area (1) along a line of alignment or symmetry.