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(54) **SPOOL FOR WINDABLE MATERIALS**

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(57) **ABSTRACT**

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Spool for windable materials, in particular for the winding on of cigarette or filter paper, at which a data carrier, preferably in the form of a chip, is arranged, the data carrier (2), which is developed for the contactless transfer of data (6, 7) specifying the spool (1) and/or the wound-on material (3) being arranged at least partly in the wall (11) of the preferably hollow-cylindrical spool (1).

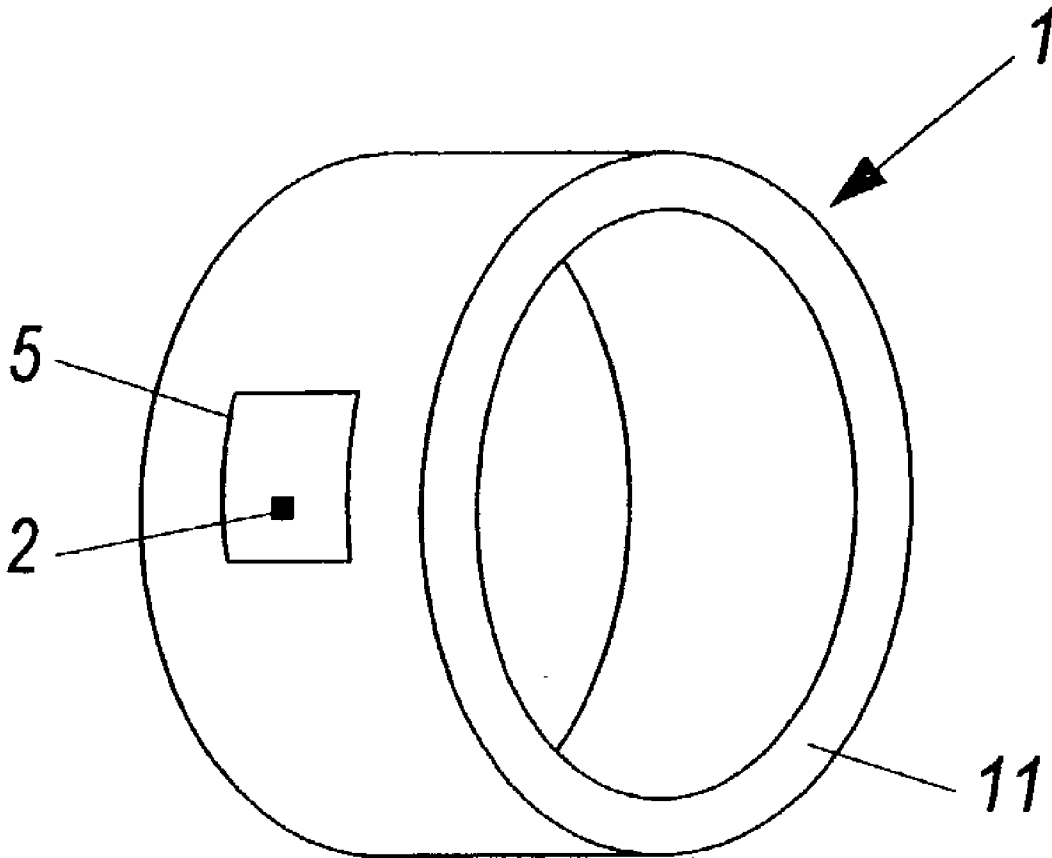


Fig. 1a

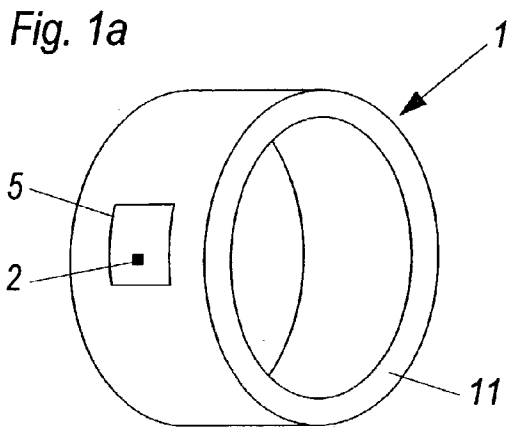


Fig. 1b

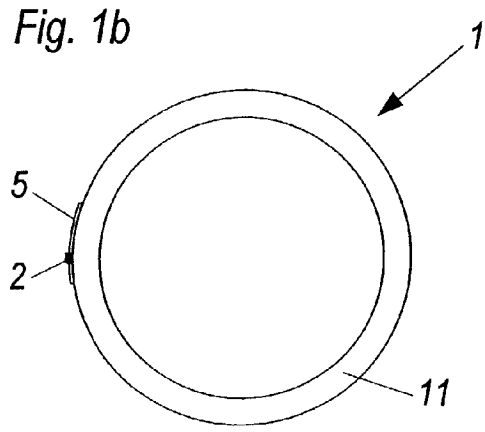


Fig. 2a

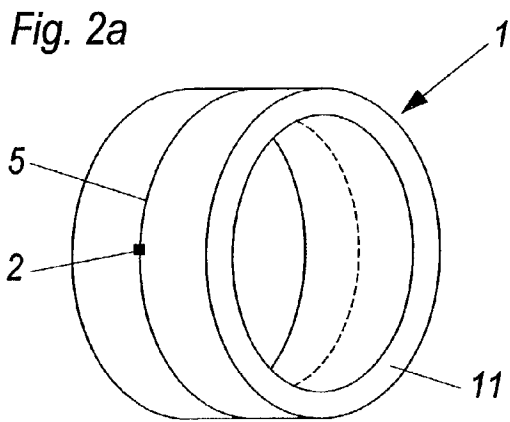


Fig. 2b

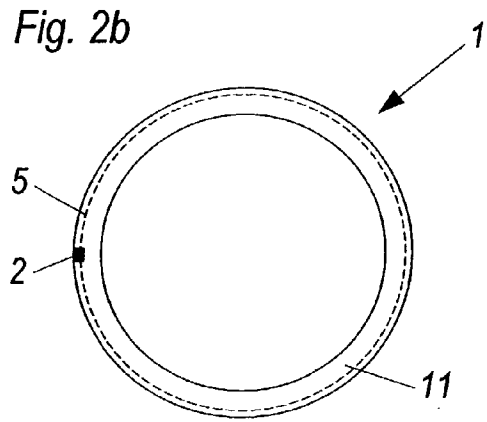


Fig. 3a

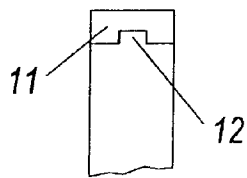


Fig. 3b

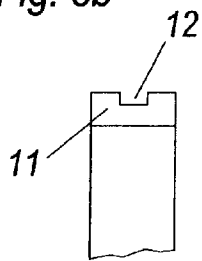


Fig. 3c

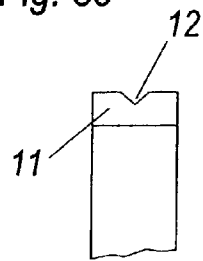
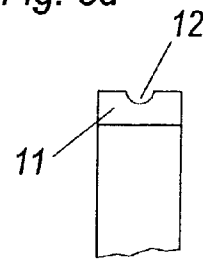


Fig. 3d



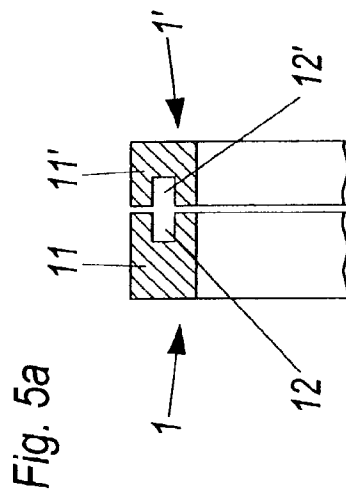
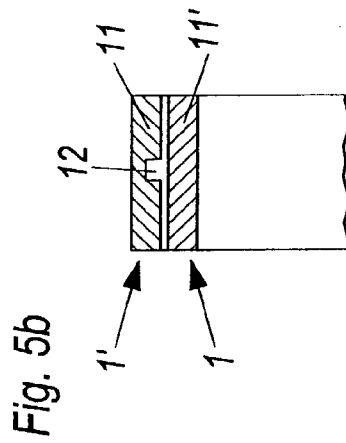
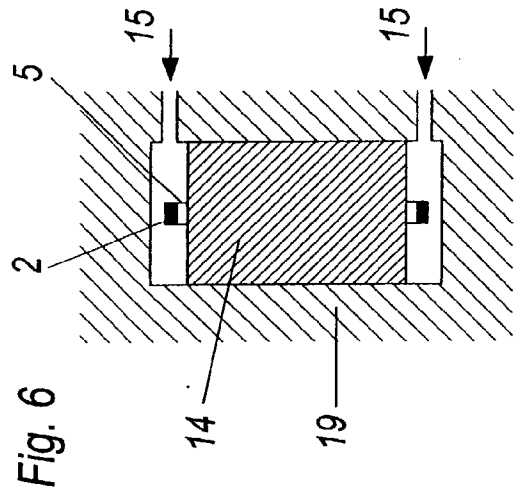
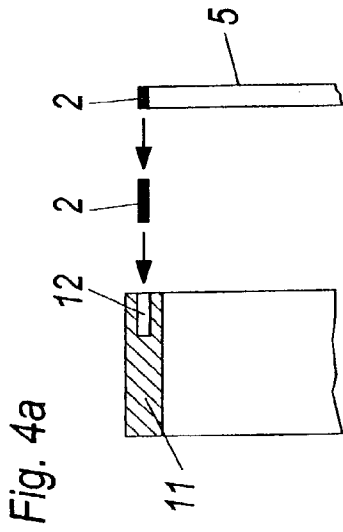
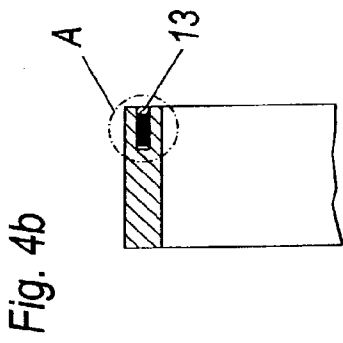
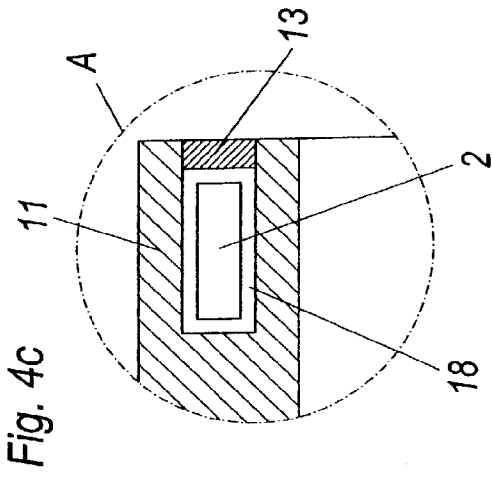


Fig. 7

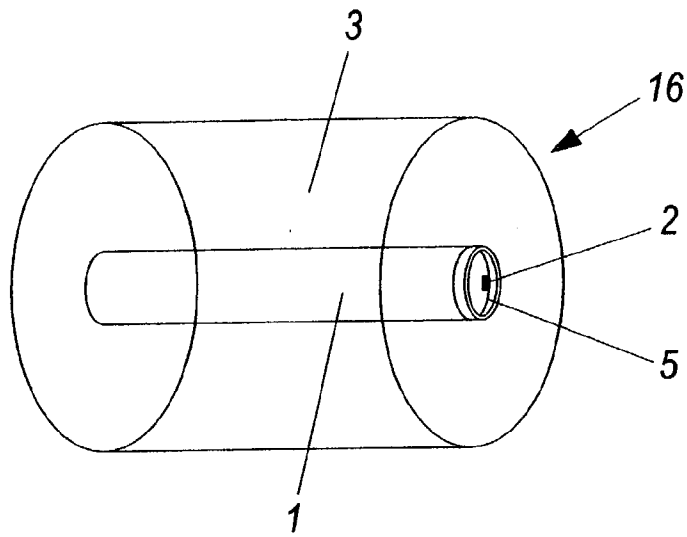


Fig. 8

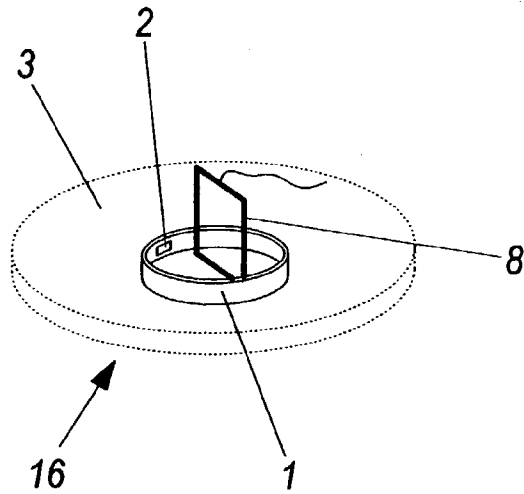


Fig. 9

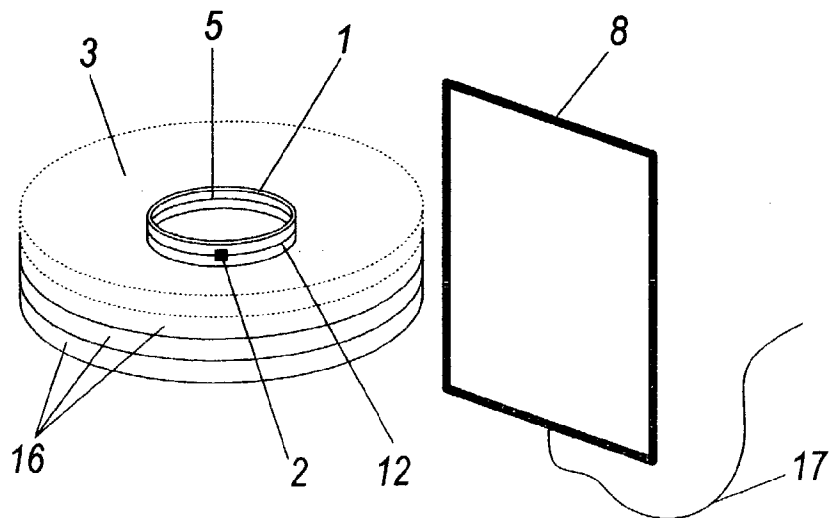


Fig. 10

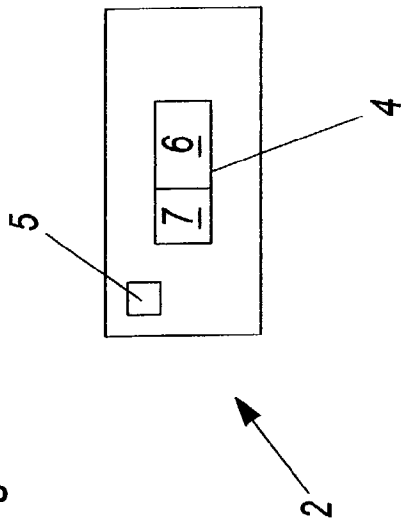
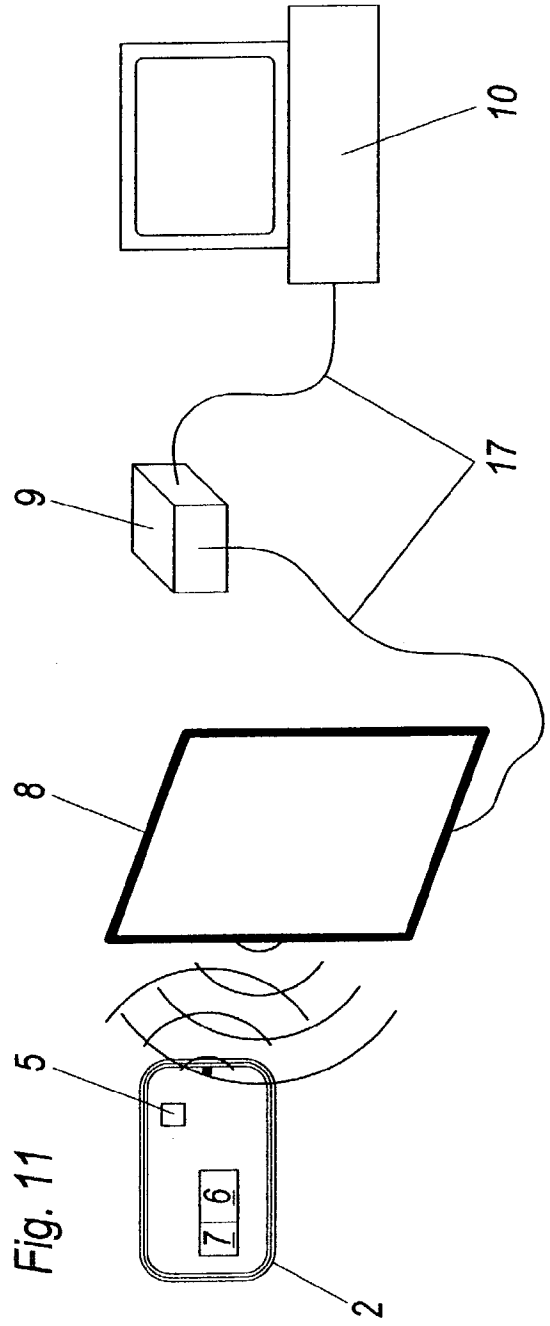


Fig. 11



## SPOOL FOR WINDABLE MATERIALS

### DESCRIPTION

[0001] The invention relates to a spool for windable materials, in particular for the winding on of cigarette or filter paper, at which a data carrier, preferably in the form of a chip, is arranged.

[0002] Spools have already been known for a long time and are used for example for the winding on of wire, electric cables or the like. In particular in cigarette production, it has been shown however that conventional spools onto which the cigarette or filter paper is wound do not satisfy the requirements of modern logistics. Thus it was not possible for the cigarette producer for example to create a relationship between the spool and the material wound onto it or to check whether the spool provided for him by the cigarette paper manufacturer had supplied him is actually provided with the corresponding cigarette paper.

[0003] To solve this problem it is likewise known to provide the spool with the wound-on material with a data carrier. The information carriers, generally developed as disposable data carriers, are attached to the outer peripheral surface of the wound-on material or the spool.

[0004] It has proved disadvantageous with this state of the art that such data carriers attached to the outer peripheral surface of the wound-on material can be used for only one transport route, for example from the cigarette paper manufacturer to the cigarette producer. Furthermore, because of its exposed location on the outer peripheral surface of the wound-on material or the spool, the data carrier is scarcely protected, for which reason the data carrier can relatively easily be damaged or even lost.

[0005] The object of the invention is to provide a novel spool which avoids the aforementioned disadvantages and makes possible a logistical management of the spool together with the materials wound onto it.

[0006] According to the invention this is achieved in that the data carrier, which is developed for the contactless transfer of data specifying the spool and/or the wound-on material is arranged at least partly in the wall of the preferably hollow-cylindrical spool. The transfer of data specifying the spool and/or the wound-on material and the automation associated therewith can make a major contribution to the reduction of production costs, and according to a preferred version the data carrier accordingly displays preferably encoded spool-specific data and/or material-specific data, for example an unmistakable ID number, and a printed, wound or etched antenna.

[0007] Because the data carrier is arranged at least partly in the wall of the spool, the data carrier is very largely protected against outside influences, as a result of which its life is naturally prolonged. This can be arranged particularly easily if the wall of the spool has a preferably prefabricated recess, the data carrier being arranged in this recess.

[0008] According to a further embodiment of the invention, the data carrier is enclosed on all sides by the material of the spool, which results in an even better protection of the data carrier. According to a variant version of the invention, this is achieved if the spool is developed in several parts and at least one part of the spool has a recess which is sealed by

a second part of the spool accompanied by development of a cavity in which the data carrier is arranged.

[0009] If the spools are intended to be used repeatedly, it has proved advantageous if these are formed from plastic material. A preferred variant version provides that the data carrier is cast into the wall of the spool, which results, in addition to a simple manufacturing process, in a particularly good protection of the data carrier. In principle it is also possible, however, to make the spool from paper or cardboard.

[0010] In order to improve the transmission and reception properties of the data carrier, it can be provided according to a further aspect of the invention to guide the spool round in the form of a ring, preferably lying outside, at the spool. In order to prevent the antenna from slipping or being damaged during the winding process, a preferred version of the invention provides that this is arranged in a groove running round at the spool.

[0011] Furthermore, a handling system for spools is to be provided, the handling system comprising a transmission/reception unit for the reception of the data stored on the data carrier or for the description of the data carrier, and the transmission/reception unit being developed for the activation of the data carrier, preferably by means of a signal sent from an antenna. The use is thereby made possible of data carriers that are passive in relation to their power supply, so that a continuous transmission of the information located on the data carrier can be avoided. If, as a further version of the invention provides, the received data are now transferred from the transmission/reception unit over a data line and/or wireless to a reading unit and subsequently to a memory and/or processing apparatus, it is possible to request product data without connection to a data bank and without a network direct from the data carrier.

[0012] A further embodiment of the invention provides for a memory and/or processing apparatus which is developed for the description of the data carrier by means of the transmission/reception unit. It is thereby possible by very simple means to provide a re-usable spool whose data carrier always has the most up-to-date data available.

[0013] According to a further aspect of the invention, a process for the handling of spools with a data carrier which is developed for the contactless transfer of data specifying the spool and/or the wound-on material and a transmission/reception unit for the activation of the data carrier provides for the introduction of the transmission/reception unit for the activation of the data carrier into the hollow-cylindrical spool in order to in this way avoid a simultaneous activation of several data carriers of different spools by the transmission/reception unit.

[0014] Further advantages and details are explained in more detail with the help of the following description of figures, with reference to the drawing. There are shown in:

[0015] **FIGS. 1a** and **b** a spool with data carrier arranged thereon according to the state of the art,

[0016] **FIGS. 2a** and **b** a schematic representation of a spool according to the invention, at which a data carrier is arranged,

[0017] **FIGS. 3a** to **d** a section cut from the wall of a spool according to the invention with differently developed recesses,

[0018] FIGS. 4*a*, *b* and *c* the arrangement of a data carrier in a cavity sealed with a cover in the wall of the spool,

[0019] FIG. 6*a* schematic representation of an injection mould for a spool according to the invention,

[0020] FIGS. 5*a*, *b* a schematic representation of two design possibilities of a divided spool,

[0021] FIG. 7*a* schematic representation of a spool with material wound onto it,

[0022] FIGS. 8 and 9 different types of activation of the data carrier,

[0023] FIG. 10 an outline representation of a data carrier and

[0024] FIG. 11 a function outline of the handling system.

[0025] In FIGS. 1*a* and *b* a spool 1 is represented with a data carrier 2 arranged at it, such as is already known from the state of the art. The data carrier 2 has an antenna 5 and is arranged at the outer peripheral surface of the wall 11 of the hollow-cylindrical spool 1. As can be seen from FIG. 2, the data carrier 2 projects from the outer peripheral surface of the wall 11 of the spool 1, so that it is scarcely protected against outside influences.

[0026] FIG. 2 shows a schematic representation of the spool 1 according to the invention, in which the data carrier 2 is arranged at least partly in the wall 11 of the hollow-cylindrical spool 1. The antenna 5 of the data carrier 2 is arranged in a groove (not shown) running round on the outside at the wall 11 of the spool 1, so that both the data carrier 2 and the antenna 5 are much better protected compared with the state of the art. Some of the possible versions of such a recess 12 are shown in FIGS. 3*a* to *d*. In FIG. 3*a* the U-shaped recess 12 is arranged at the inner peripheral surface of the wall 11 of the spool 1, whereas in FIGS. 3*b* to 3*d* the recess 12 is arranged at the outer peripheral surface of the wall 11 of the spool 1. The shape of the recess is of course not limited to the U-shaped, V-shaped and semicircular developments shown.

[0027] FIG. 4 shows an embodiment of the invention in which a groove 12, which can for example be milled in, is developed in the wall 11 of the spool 1. Subsequently the data carrier 2, which can also have an annular antenna 5, is inserted into the recess 12 and the recess 12 is then sealed with a cover 13 accompanied by formation of a cavity 18 in the wall 11. This cover 13 can for example be glued to the wall 11 or joined to it by casting. A particularly simple possibility of the development of a cavity in the wall 11 of the spool results if, as represented in FIGS. 5*a* and *b*, the spool is developed in several parts, a recess 12 being arranged at least in one wall 11' of the spool 1'. This recess 12 is sealed by the wall 11 of the second part of the spool 1 accompanied by formation of a cavity.

[0028] If the spool is made from plastic material, manufacture by means of injection moulding naturally suggests itself (FIG. 6). The data carrier 2 plus antenna 5 are arranged before the injection process between the mould 19 and the core 14, so that it is cast in upon the introduction of the plastic material 15 into the wall 11 of the spool.

[0029] FIG. 7 shows a spool 1 at which a data carrier 2 is arranged. The material 3, for example cigarette paper, is wound onto the spool 1. The data carrier 2 is developed as

a data carrier that is passive in relation to its power supply and is in the form of a chip, as represented in FIG. 10. An encoded data field 4 plus a wound antenna 5 are arranged on the chip. Printed or etched antennae are of course also suitable. The encoded data field 4 contains both spool-specific data 6 and material-specific data 7.

[0030] FIG. 11 shows the mode of operation of a handling system for the spools according to the invention. The antenna 8 transmits a signal by which the data carrier 2 which is arranged at the spool 1 is activated, whereupon the data carrier 2 for its part sends out, via its antenna 5, the data 6, 7 stored on it. These data 6, 7 are received by the transmission/reception unit via the antenna 8 and passed to a reading unit 9, the transfer of the data 6, 7 being via a data line 7. A wireless transfer of the data is of course also possible. Subsequently, the data 6, 7 are passed on from the reading unit 9 to the memory and processing apparatus 10 and processed by the latter.

[0031] FIG. 8 shows the use of the spool according to the invention as the core 1 of a bobbin 16. Cigarette paper 3 is wound onto the spool core 1. The data carrier 2 is cast into the bobbin core 1, i.e. the data carrier 2 is enclosed on all sides by the material of the bobbin core 1. The bobbin core 1 itself is developed as an open, double-walled cylinder, so that the antenna 8 can be introduced into the bobbin core 1.

[0032] FIG. 9 shows a further embodiment, in which several bobbins 16 are wound onto a common core 1. The data carrier 2 or annular antenna 5 is, in this embodiment, arranged in a groove 12 running on all sides at the outer cylinder wall. Further, the data carrier 2 is activated by the antenna 8 and thereupon transmits the data stored on it.

1. Spool for windable materials, in particular for the winding on of cigarette or filter paper, at which a data carrier, preferably in the form of a chip, is arranged, characterized in that the data carrier (2), which is developed for the contactless transfer of data (6, 7) specifying the spool (1) and/or the wound-on material (3), is arranged at least partly in the wall (11) of the preferably hollow-cylindrical spool (1).

2. Spool according to claim 1, characterized in that the wall (11) of the spool (1) has a preferably prefabricated recess (12), the data carrier (2) being arranged in this recess.

3. Spool according to claim 1, characterized in that the data carrier (2) is enclosed on all sides by the material of the spool (1).

4. Spool according to claim 3, characterized in that the spool (1) is developed in several parts, at least one part (1') of the spool having a recess (12') which is sealed by a second part (1) of the spool accompanied by development of a cavity (18) in which the data carrier (2) is arranged.

5. Spool according to one of claims 1 to 4, characterized in that the spool (1) is formed from plastic material, preferably polystyrene.

6. Spool according to claim 5, characterized in that the data carrier (2) is cast into the wall (11) of the spool (1).

7. Spool according to claims 1 to 6, characterized in that the data carrier (2) contains preferably encoded spool-specific data (6) and/or material-specific data (7), for example an unmistakable ID number.

8. Spool according to one of claims 1 to 7, characterized in that the data carrier (2) has a printed, wound or etched antenna (5).

9. Spool for windable materials, in particular for the winding on of cigarette or filter paper, at which a data carrier, preferably in the form of a chip, is arranged, in particular according to one of claims 1 to 8, characterized by an antenna (5) guided round in the form of a ring, preferably lying outside, at the spool (1).

10. Spool according to claim 9, characterized in that the antenna (5) is arranged in a groove (12) running round at the spool (1).

11. Handling system for spools, in particular according to one of claims 1 to 10, the handling system comprising a transmission/reception unit for the reception of the data stored on the data carrier or for the description of the data carrier, characterized in that the transmission/reception unit (8) is developed for the activation of the data carrier (2).

12. Handling system according to claim 11, characterized in that the received data (6, 7) are transferred from the transmission/reception unit (8) over a data line (17) and/or wireless to a reading unit (9).

13. Handling system according to claim 11 or 12, characterized in that the received data (6, 7) are transferred to a memory and/or processing apparatus (10).

14. Handling system according to claim 11, characterized by a memory and/or processing apparatus (10) which is developed for the description of the data carrier (2) by means of the transmission/reception unit (8).

15. Process for the handling of spools with a data carrier which is developed for the contactless transfer of data specifying the spool and/or the wound-on material and a transmission/reception unit for the activation of the data carrier, in particular according to one of claims 1 to 14, characterized in that the transmission/reception unit (8) for the activation of the data carrier (2) is introduced into the hollow-cylindrical spool (1).

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