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INTEGRATED RFID IN INK SUPPLIES ASSEMBLY THROUGH BUILT-IN ANTENNA

HP INC

Integrated RFID in Ink Supplies Assembly through Built-in Antenna

Abstract: A technique is disclosed for integrating a built-in antenna for RFID capability into an ink supply assembly.

This disclosure relates to the field of ink supplies.

A technique is disclosed that integrates a built-in antenna for RFID capability into an ink supply assembly.

Currently, RFID devices are included with some ink supply assemblies in the form of external chips attached to the assemblies. Adding RFID capability has increased the cost of ink supplies, due to the RFID chip, the tag antenna, and the additional assembly processes such as antenna stamping and IC assembly to the antenna. If the RFID assembly processes are outsourced by the ink supply manufacturer, additional logistical costs and issues can result. In addition, there are security considerations because one can remove an existing RFID from, or attach a new RFID to, an ink supply assembly because the RFID is external to the ink supply.

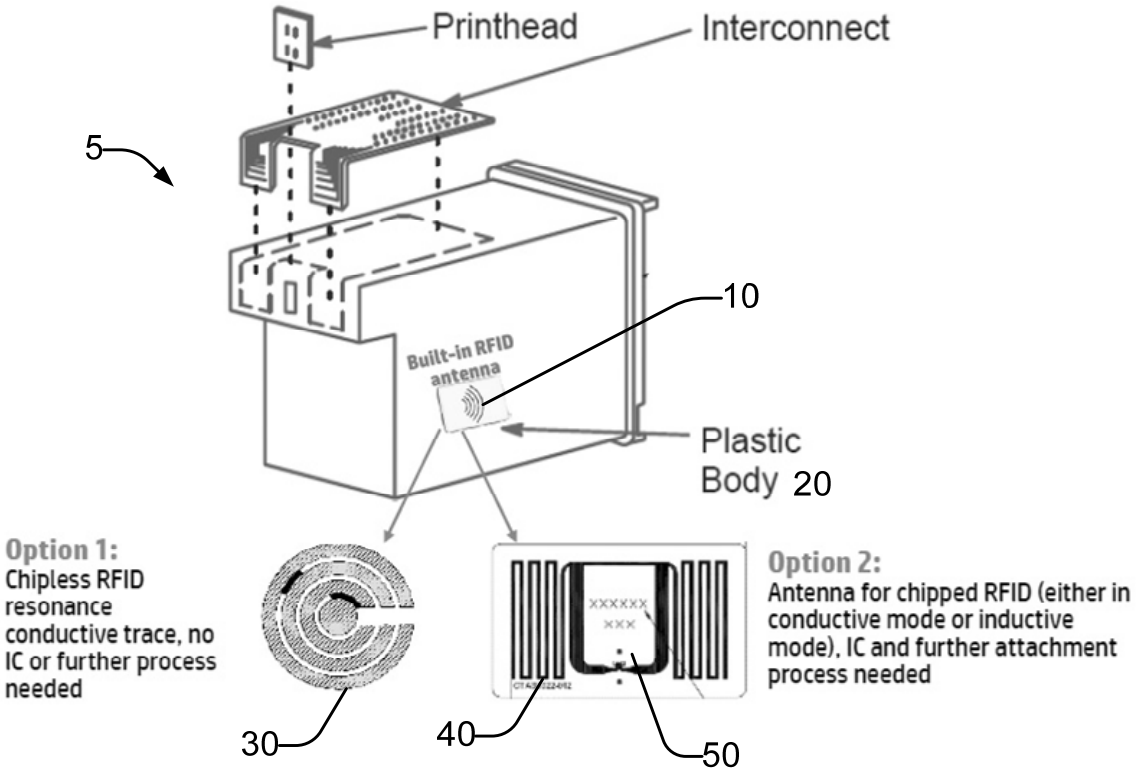
According to the present disclosure, and as understood with reference to the Figure, an ink supply includes a built-in RF antenna usable for either chipped or chipless RFID. In some cases the antenna is in the ink supply pen body, while in other cases it is in the ink delivery system.

Laser direct structure (LDS) fabrication technology such as, for example, LPKF MID is usable to fabricate metal traces in the pen body or the ink delivery system of an ink supply assembly. Such traces are used to fabricate a tag antenna for either chipped or chipless RFID as a built-in component of the pen body or the ink delivery system. The antenna position may be chosen based at least in part on RF interference considerations.

In one example, a built-in antenna 10 is fabricated in the plastic body 20 of an inkjet pen 5. A first version of the antenna 10 is an antenna 30 for a chipless RFID resonance conductive trace. A second version of the antenna 10 is an antenna 40 for a chipped RFID that operates in either conductive or inductive mode together with an IC 50.

The disclosed technique advantageously simplifies the manufacturing process, reduces cost, and increases security. In configurations where the antenna is disposed in the pen body, the signal strength detected can also indicate whether the pen is empty or full of ink, and thus provide a convenient mechanism for an ink state sensor.

Disclosed by Ning Ge, Jesus Alberto Leano Blanco, Robert Ionescu, Roberto Per Silveira, Helen A. Holder, HP Inc.


Printhead
Interconnect
5
10
Built-in RFID antenna
Plastic Body 20
Option 1:
Chipless RFID resonance conductive trace, no IC or further process needed
Option 2:
Antenna for chipped RFID (either in conductive mode or inductive mode), IC and further attachment process needed
30
40
50