



US009252611B2

(12) **United States Patent**  
**Lee et al.**

(10) **Patent No.:** **US 9,252,611 B2**  
(45) **Date of Patent:** **Feb. 2, 2016**

(54) **MAGNETIC FIELD SHIELDING SHEET FOR A WIRELESS CHARGER, METHOD FOR MANUFACTURING SAME, AND RECEIVING APPARATUS FOR A WIRELESS CHARGER USING THE SHEET**

(71) Applicant: **AMONSENSE CO., LTD.**, Cheonan-si (KR)

(72) Inventors: **Dong Hoon Lee**, Yongin-si (KR); **Kil Jae Jang**, Seoul (KR)

(73) Assignee: **AMONSENSE CO., LTD.** (KR)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 36 days.

(21) Appl. No.: **14/366,439**

(22) PCT Filed: **Dec. 21, 2012**

(86) PCT No.: **PCT/KR2012/011256**

§ 371 (c)(1),  
(2) Date: **Jun. 18, 2014**

(87) PCT Pub. No.: **WO2013/095036**

PCT Pub. Date: **Jun. 27, 2013**

(65) **Prior Publication Data**

US 2015/0123604 A1 May 7, 2015

(30) **Foreign Application Priority Data**

Dec. 21, 2011 (KR) ..... 10-2011-0138987

(51) **Int. Cl.**

**H01M 10/44** (2006.01)  
**H01M 10/46** (2006.01)

(Continued)

(52) **U.S. Cl.**

CPC ..... **H02J 7/0042** (2013.01); **B32B 37/12** (2013.01); **B32B 37/18** (2013.01);

(Continued)

(58) **Field of Classification Search**

CPC ..... H02J 5/005; H02J 7/025; H02J 7/0042; H02J 7/355; H01F 27/362; H01F 27/365  
USPC ..... 320/107, 108, 114; 336/84 R, 84 C  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,774,148 A \* 9/1988 Goto ..... B32B 15/04  
428/607  
5,097,373 A \* 3/1992 Yuki ..... H01F 3/02  
360/125.01

(Continued)

FOREIGN PATENT DOCUMENTS

JP 2006269536 10/2006  
KR 1020030013831 2/2003

(Continued)

OTHER PUBLICATIONS

International Search Report—PCT/KR2012/011256 dated Mar. 18, 2013.

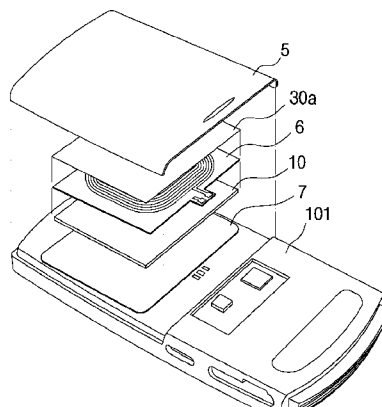
*Primary Examiner* — Edward Tso

(74) *Attorney, Agent, or Firm* — Cantor Colburn LLP

(57) **ABSTRACT**

Provided are a magnetic field shield sheet for a wireless charger, which blocks an effect of an alternating-current magnetic field generated when a charger function for a portable mobile terminal device is implemented in a non-contact wireless manner on a main body of the portable mobile terminal device and exhibits excellent electric power transmission efficiency, a method of manufacturing the sheet, and a receiver for the wireless charger by using the sheet. The sheet includes: at least one layer thin magnetic sheet made of an amorphous ribbon separated into a plurality of fine pieces; a protective film that is adhered on one surface of the thin magnetic sheet via a first adhesive layer provided on one side of the protective film; and a double-sided tape that is adhered on the other surface of the thin magnetic sheet via a second adhesive layer provided on one side of the double-sided adhesive tape, wherein gaps among the plurality of fine pieces are filled by some parts of the first and second adhesive layers, to thereby isolate the plurality of fine pieces.

**18 Claims, 11 Drawing Sheets**



- (51) **Int. Cl.**  
*H02J 7/00* (2006.01)  
*H01F 38/14* (2006.01)  
*H01F 27/36* (2006.01)  
*B32B 37/12* (2006.01)  
*B32B 37/18* (2006.01)  
*B32B 38/00* (2006.01)  
*H02J 7/02* (2006.01)  
*H02J 5/00* (2006.01)
- (52) **U.S. Cl.**  
 CPC ..... *B32B 38/0004* (2013.01); *H01F 27/365*  
 (2013.01); *H01F 38/14* (2013.01); *H02J 5/005*  
 (2013.01); *H02J 7/025* (2013.01)

- (56) **References Cited**
- U.S. PATENT DOCUMENTS
- 5,227,727 A \* 7/1993 Segawa ..... G01R 33/36  
 324/318
- 5,680,046 A \* 10/1997 Frederick ..... G01R 33/422  
 324/318
- FOREIGN PATENT DOCUMENTS
- KR 1020030051394 6/2003
- KR 1020030086122 11/2003
- KR 1020100031139 3/2010
- KR 101399024 5/2014
- \* cited by examiner

FIG. 1

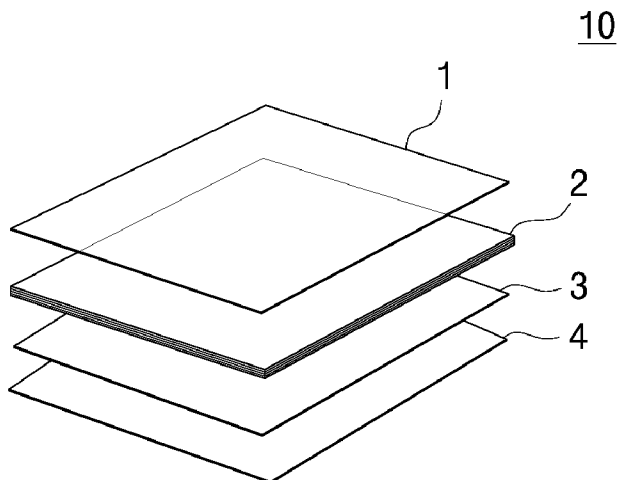


FIG. 2

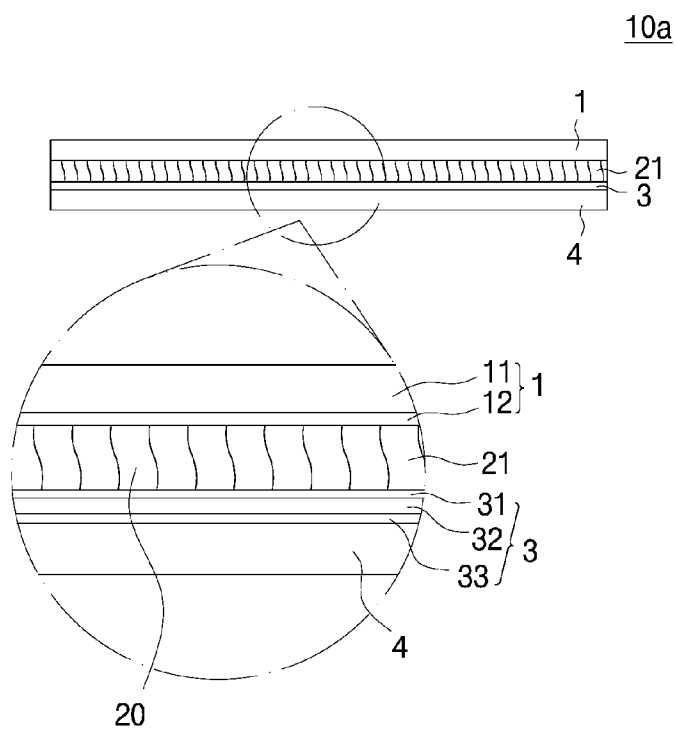


FIG. 3

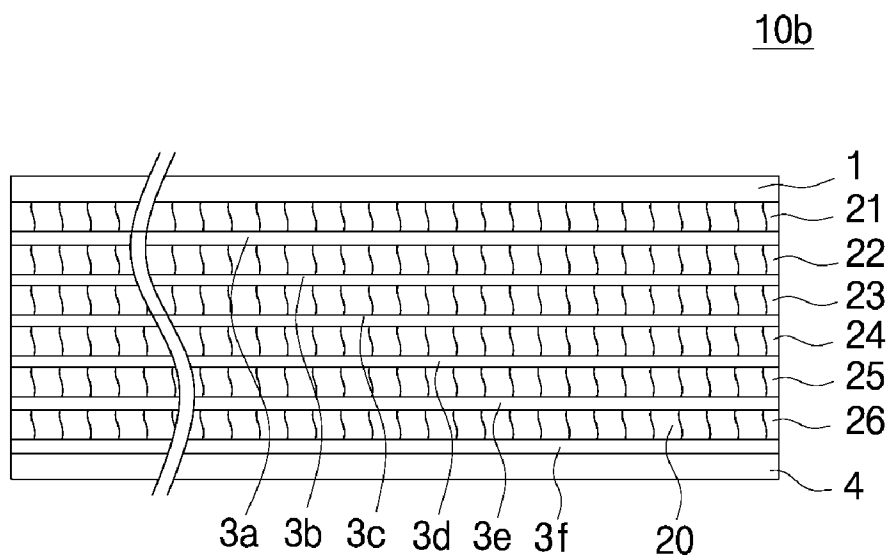


FIG. 4

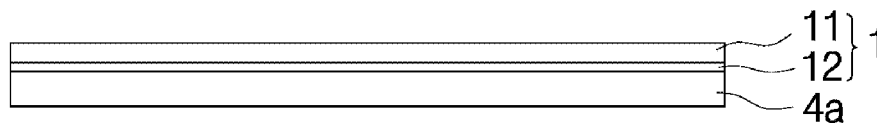


FIG. 5

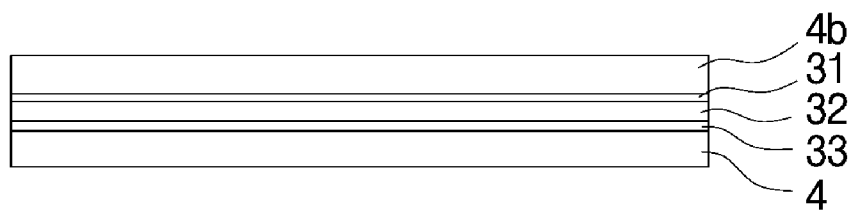
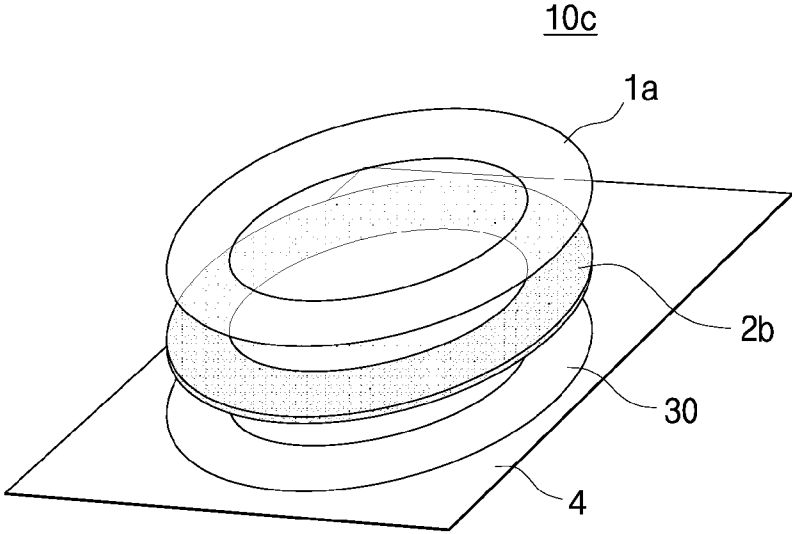


FIG. 6



# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.