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granted US patents**



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

(10) **Patent No.:** **US 10,884,349 B2**
(45) **Date of Patent:** **Jan. 5, 2021**

(54) **METHOD OF MANUFACTURING A MULTI-LAYER ARTICLE**

(71) Applicant: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(72) Inventors: **Benzion Landa**, Nes Ziona (IL); **Sagi Abramovich**, Ra'anana (IL); **Moshe Levanon**, Rehovot (IL); **Helena Chechik**, Rehovot (IL)

(73) Assignee: **LANDA LABS (2012) LTD.**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **16/203,647**

(22) Filed: **Nov. 29, 2018**

(65) **Prior Publication Data**
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(Continued)

(30) **Foreign Application Priority Data**

May 30, 2016 (GB) 1609463.3

(51) **Int. Cl.**
G03G 7/00 (2006.01)
B32B 7/12 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **G03G 7/0093** (2013.01); **G03G 7/0086** (2013.01); **B32B 7/12** (2013.01);
(Continued)

(58) **Field of Classification Search**
USPC 156/247
See application file for complete search history.

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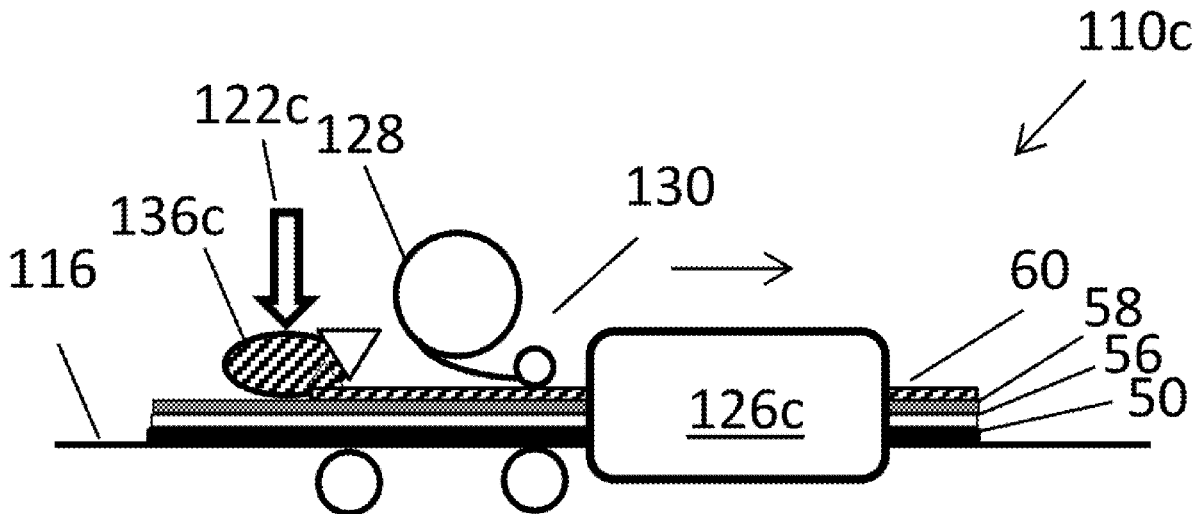
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Primary Examiner — Sing P Chan
(74) *Attorney, Agent, or Firm* — Marc Van Dyke; Momentum IP

(57) **ABSTRACT**

There is disclosed a method of manufacturing a multi-layered article including a finished outer surface optionally having particular surface properties. The article can be a self-supported strip having a smooth outer surface. The method is, for example, suitable for the preparation of multi-layered articles such as a flexible intermediate transfer member (ITM) for use in an indirect printing system. Uses of such articles are also disclosed.

26 Claims, 3 Drawing Sheets



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

(10) **Patent No.:** **US 10,870,742 B2**
(45) **Date of Patent:** **Dec. 22, 2020**

(54) **TRANSFER MEMBER FOR PRINTING SYSTEMS**

(58) **Field of Classification Search**
CPC C08K 3/36; C08K 5/5419; C08K 5/544;
C08K 2201/005; C08K 3/04; C09C 3/10;
(Continued)

(71) Applicant: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(72) Inventors: **Benzion Landa**, Nes Ziona (IL); **Sagi Abramovich**, Ra'anana (IL); **Amit Haviv**, Petach Tikva (IL)

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(73) Assignee: **LANDA LABS (2012) LTD.**, Rehovot (IL)

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(21) Appl. No.: **16/795,221**

EP 0400544 A2 12/1990
GB 2474474 A 4/2011
JP H0532897 9/1993

(22) Filed: **Feb. 19, 2020**

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(65) **Prior Publication Data**
US 2020/0183305 A1 Jun. 11, 2020

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(Continued)

Related U.S. Application Data

(63) Continuation of application No. 16/424,712, filed on May 29, 2019, now Pat. No. 10,606,191, which is a (Continued)

Primary Examiner — G.M. A Hyder
(74) *Attorney, Agent, or Firm* — Marc Van Dyke

Foreign Application Priority Data

(30) Nov. 30, 2016 (WO) PCT/IB2016/057226

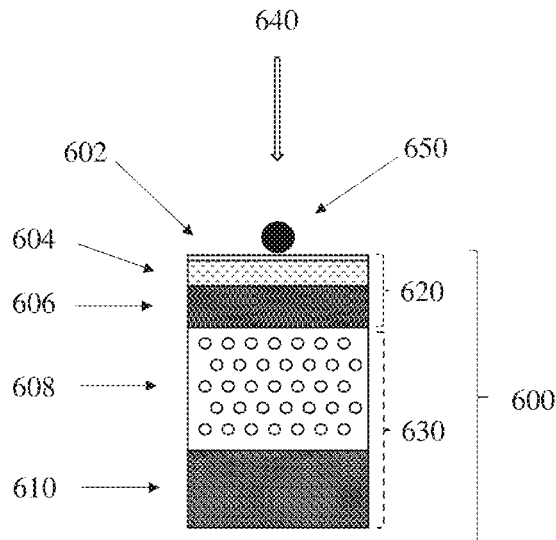
(57) **ABSTRACT**

(51) **Int. Cl.**
B41M 5/025 (2006.01)
C08K 3/36 (2006.01)
(Continued)

There is disclosed a layered article that can be used in indirect printing, in analog or digital processes. The layered article, when configured as a transfer member, may serve to receive an ink in any form, allow the ink to be treated so as to form an ink image, and permit the application of the ink image on a substrate. The transfer member comprises a support layer and an imaging layer, which may be formed of a silicon matrix including dispersed carbon black particles. Methods for preparing the same are also disclosed.

(52) **U.S. Cl.**
CPC **C08K 3/36** (2013.01); **B41J 2/0057** (2013.01); **B41M 5/025** (2013.01);
(Continued)

20 Claims, 2 Drawing Sheets





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

(10) **Patent No.:** **US 10,617,610 B2**
(45) **Date of Patent:** **Apr. 14, 2020**

(54) **UV-PROTECTIVE COMPOSITIONS**

(71) Applicant: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(72) Inventors: **Benzion Landa**, Nes Ziona (IL); **Sagi Abramovich**, Ra'anana (IL); **Snir Dor**, Petach Tikva (IL)

(73) Assignee: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 178 days.

(21) Appl. No.: **15/744,816**

(22) PCT Filed: **Jul. 22, 2016**

(86) PCT No.: **PCT/IB2016/054397**

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(2) Date: **Jan. 14, 2018**

(87) PCT Pub. No.: **WO2017/013633**

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(65) **Prior Publication Data**

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(30) **Foreign Application Priority Data**

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Jul. 22, 2015 (GB) 1512958.8
Apr. 6, 2016 (GB) 1605857.0

(51) **Int. Cl.**

A61K 8/02 (2006.01)
A61K 8/29 (2006.01)
A61K 8/81 (2006.01)
A61Q 17/04 (2006.01)
A61K 8/19 (2006.01)

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

CPC **A61K 8/0254** (2013.01); **A61K 8/0241** (2013.01); **A61K 8/0283** (2013.01); **A61K 8/19** (2013.01); **A61K 8/29** (2013.01); **A61K 8/8147** (2013.01); **A61Q 17/04** (2013.01); **A61K 2800/412** (2013.01); **A61K 2800/413** (2013.01); **A61K 2800/546** (2013.01)

(58) **Field of Classification Search**

CPC **A61K 2800/412**; **A61K 2800/413**; **A61K 2800/546**; **A61K 8/0241**; **A61K 8/0254**; **A61K 8/0283**; **A61K 8/19**; **A61K 8/29**; **A61K 8/8135**; **A61K 8/8147**; **A61Q 17/04**

See application file for complete search history.

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Primary Examiner — Anna R Falkowitz

(74) Attorney, Agent, or Firm — Marc Van Dyke

(57) **ABSTRACT**

Disclosed are UV-protective compositions comprising swelled polymer matrix macroparticles comprising a thermoplastic polymer swelled with at least one swelling agent, and a plurality of nanoparticles of an inorganic UV-protective agent comprising at least one solid inorganic crystal and a dispersant associated with the crystal, wherein the inorganic nanoparticles are dispersed and embedded in the swelled polymer matrix macroparticles. Method of preparation and uses of such compositions are also provided.

19 Claims, 7 Drawing Sheets



US010606191B2

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

(10) **Patent No.:** **US 10,606,191 B2**
(45) **Date of Patent:** **Mar. 31, 2020**

(54) **TRANSFER MEMBER FOR PRINTING SYSTEMS**

(71) Applicant: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(72) Inventors: **Benzion Landa**, Nes Ziona (IL); **Sagi Abramovich**, Ra'anana (IL); **Amit Haviv**, Petach Tikva (IL)

(73) Assignee: **LANDA LABS (2012) LTD.**, Rehovot (IL)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **16/424,712**

(22) Filed: **May 29, 2019**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/IB2017/057556, filed on Nov. 30, 2017.

(30) **Foreign Application Priority Data**

Nov. 30, 2016 (WO) PCT/IB2016/057226

(51) **Int. Cl.**

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B41M 5/025 (2006.01)

(Continued)

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

CPC **G03G 15/162** (2013.01); **B41J 2/0057** (2013.01); **B41M 5/025** (2013.01);
(Continued)

(58) **Field of Classification Search**

CPC G03G 15/162; C09C 3/10; C09C 1/56; C08K 5/544; C08K 5/5419; C08K 3/36;
(Continued)

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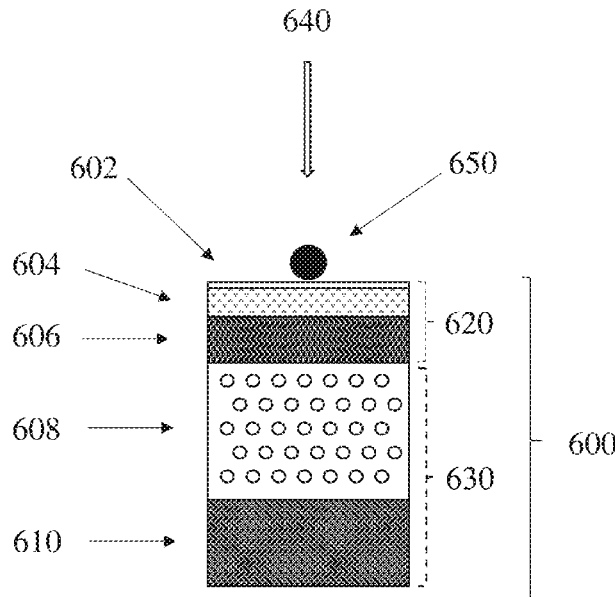
Primary Examiner — G. M. A Hyder

(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(57) **ABSTRACT**

There is disclosed a layered article that can be used in indirect printing, in analog or digital processes. The layered article, when configured as a transfer member, may serve to receive an ink in any form, allow the ink to be treated so as to form an ink image, and permit the application of the ink image on a substrate. The transfer member comprises a support layer and an imaging layer, which may be formed of a silicon matrix including dispersed carbon black particles. Methods for preparing the same are also disclosed.

19 Claims, 2 Drawing Sheets





US010272469B2

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

(10) **Patent No.:** **US 10,272,469 B2**
(45) **Date of Patent:** **Apr. 30, 2019**

(54) **PROCESS FOR METALLISING A POLYMERIC SURFACE**
(71) Applicant: **LANDA LABS (2012) LTD.**, Rehovot (IL)
(72) Inventors: **Benzion Landa**, Nes Ziona (IL); **Anton Krassilnikov**, Durham, NH (US); **Sagi Abramovich**, Ra'anana (IL); **Tamar Asher**, Tel Aviv (IL)
(73) Assignee: **LANDA LABS (2012) LTD.**, Rehovot (IL)
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/571,855**
(22) PCT Filed: **May 27, 2016**
(86) PCT No.: **PCT/IB2016/053144**
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(87) PCT Pub. No.: **WO2016/189514**
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(65) **Prior Publication Data**
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(30) **Foreign Application Priority Data**
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Feb. 10, 2016 (GB) 1602420.0

(51) **Int. Cl.**
B05D 3/12 (2006.01)
B05D 5/06 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **B05D 5/068** (2013.01); **B05D 3/12** (2013.01); **B05D 5/06** (2013.01); **B05D 5/063** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC . B05D 3/12; B05D 5/06; B05D 5/063; B05D 5/067; B05D 5/068; B05D 7/02;
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Primary Examiner — William P Fletcher, III
(74) *Attorney, Agent, or Firm* — Marc Van Dyke

(57) **ABSTRACT**
A process for metallising a polymeric surface of an article, the process including applying to the polymeric surface a liquid carrier containing a suspension of metallic or metal-looking particles, wherein the polymeric surface and the liquid carrier are such that the wetting angle between the liquid carrier and the polymeric surface is of substantially 90° or above, and wherein the particles and the polymeric surface are such that the particles have a greater affinity to
(Continued)

