



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.05.2022 Bulletin 2022/21

(51) International Patent Classification (IPC):
A47G 21/18 (2006.01)

(21) Application number: **21201900.4**

(52) Cooperative Patent Classification (CPC):
A47G 21/18; A47G 21/186; A47G 2400/02

(22) Date of filing: **11.10.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

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(30) Priority: **18.11.2020 TW 109140356**

(54) **EASY-TO-CLEAN STRAW**

(57) An easy-to-clean straw including an outer tube wall (100), an uneven inner tube wall (110) and a channel (120) enclosed by the uneven inner tube wall; where the uneven inner tube wall has a plurality of protrusions (111)

thereon to enable a user to press and roll the outer tube wall to rub the uneven inner tube wall with the plurality of protrusions, thereby effectively removing remnants left on the uneven inner tube wall.

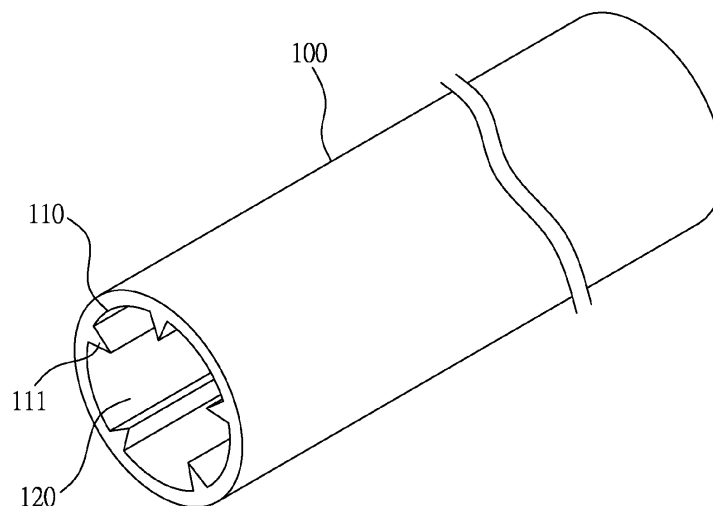


FIG. 1

Description

Field of the Invention

[0001] The present invention relates to a straw, in particular to a straw having an inner structure to facilitate the cleaning of the inner surface of the straw.

Description of the Related Art

[0002] In the context of increasingly stringent environmental regulations, many countries have begun to restrict or ban disposable plastic straws.

[0003] In order to comply with laws and regulations, environmentally friendly materials, such as paper or corn flour, have been used to make disposable straws. However, due to the large consumption of straws, discarded straws still produce a lot of garbage.

[0004] To solve the problem mentioned above, reusable straws have been proposed. However, the cleaning of the inner surface of the reusable straws poses another problem. To cope with the cleaning issue, a Taiwan patent 1674868 has proposed a detachable straw, which is mainly composed of two magnetic half-tube bodies and a clasp to form a straw. However, the detachable straw of this patent has disadvantages of high cost and inherent assembly dislocation tendency.

[0005] To solve the aforementioned problems, a novel easy-to-clean straw structure is needed in the art.

SUMMARY OF THE INVENTION

[0006] The main objective of the present invention is to disclose a straw having an uneven inner tube wall distributed with a plurality of protrusions, to enable a user to press and roll the outer tube wall to rub the uneven inner tube wall with the plurality of protrusions, thereby effectively removing remnants left on the uneven inner tube wall.

[0007] Another objective of the present invention is to disclose a straw which can be folded to be stored in a box.

[0008] To attain the foregoing objectives, an easy-to-clean straw is proposed, which includes:

an outer tube wall;
an uneven inner tube wall; and
a channel enclosed by the uneven inner tube wall; where the uneven inner tube wall has a plurality of protrusions thereon to enable a user to press and roll the outer tube wall to rub the uneven inner tube wall with the plurality of protrusions, thereby effectively removing remnants left on the uneven inner tube wall.

[0009] For possible embodiments, the straw can be made of silicone or TPE (thermoplastic elastomer).

[0010] In one embodiment, the protrusions are triangular.

[0011] In one embodiment, the protrusions are square.

[0012] In one embodiment, the protrusions are semi-circular.

[0013] In one embodiment, the protrusions are polygonal.

[0014] For possible embodiments, the outer tube wall can have a cross sectional outline of a circular shape or a textured shape.

[0015] To make it easier for our examiner to understand the objective of the invention, its structure, innovative features, and performance, we use preferred embodiments together with the accompanying drawings for the detailed description of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

FIG. 1 illustrates a schematic diagram of an embodiment of the easy-to-clean straw of the present invention.

FIG. 2 illustrates another schematic view of the easy-to-clean straw of FIG. 1.

FIG. 3 illustrates a cross-sectional view of the easy-to-clean straw of FIG. 1.

FIG. 4 illustrates a cross-sectional view of another embodiment of the easy-to-clean straw of the present invention.

FIG. 5 illustrates a cross-sectional view of still another embodiment of the easy-to-clean straw of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Please refer to figures 1-3, in which, FIG. 1 illustrates a schematic diagram of an embodiment of the easy-to-clean straw of the present invention; FIG. 2 illustrates another schematic view of the easy-to-clean straw of FIG. 1; and FIG. 3 illustrates a cross-sectional view of the easy-to-clean straw of FIG. 1.

[0018] As shown in FIG. 1, the easy-to-clean straw has an outer tube wall 100, an uneven inner tube wall 110, and a channel 120. In addition, preferably, the straw of the present invention can be made of silicone or TPE (thermoplastic elastomer) to possess flexibility to be conveniently stored in a small box.

[0019] The outer tube wall 100 can be a flat surface having a circular cross sectional outline, or a textured surface having a non-circular cross sectional outline, for example, a cross sectional outline of a heart shape, a flower shape, or other geometric shapes.

[0020] The uneven inner tube wall 110 has a plurality of protrusions 111 thereon. In this embodiment, the pro-

trusions 111 are triangular.

[0021] The channel 120 is enclosed by the uneven tube wall 111 for the passage of fluid.

[0022] The principle of the present invention lies in: a plurality of protrusions 111 are arranged around the uneven inner tube wall 110, so that a user can press and roll the circular outer tube wall 100 to make the plurality of protrusions 111 rub the surface of the uneven inner tube wall 110, thereby effectively removing the remnants left on the uneven inner tube wall 110.

[0023] Based on the above description, the present invention further proposes other embodiments of the protrusion 111 on the uneven inner tube wall 110. Please refer to FIG. 4, which illustrates a cross-sectional view of another embodiment of the easy-to-clean straw of the present invention, in which the protrusions 111 are square; and refer to FIG. 5, which illustrates a cross-sectional view of still another embodiment of the easy-to-clean straw of the present invention, where the protrusions 111 are semicircular. Apart from the shapes mentioned above, the protrusions 111 of the present invention can also be polygonal.

[0024] Thanks to the proposals disclosed above, the present invention has the following advantages:

1. The straw of the present invention has an uneven inner tube wall distributed with a plurality of protrusions to enable a user to press and roll the outer tube wall to rub the uneven inner tube wall with the plurality of protrusions, thereby effectively removing remnants left on the uneven inner tube wall.
2. The straw of the present invention can be folded to be stored in a box.

[0025] While the invention has been described by way of example and in terms of preferred embodiments, it is to be understood that the invention is not limited thereto. On the contrary, it is intended to cover various modifications and similar arrangements and procedures, and the scope of the appended claims therefore should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements and procedures.

[0026] In summation of the above description, the present invention herein enhances the performance over the conventional structure and further complies with the patent application requirements and is submitted to the Patent and Trademark Office for review and granting of the commensurate patent rights.

Claims

1. An easy-to-clean straw comprising:

an outer tube wall (100);
an uneven inner tube wall (110); and
a channel (120) enclosed by the uneven inner

tube wall (110);

wherein the uneven inner tube wall (110) has a plurality of protrusions (111) thereon to enable a user to press and roll the outer tube wall (100) to rub the uneven inner tube wall (110) with the plurality of protrusions (111), thereby effectively removing remnants left on the uneven inner tube wall (110).

2. The easy-to-clean straw as disclosed in claim 1, wherein the straw is made of silicone or TPE.
3. The easy-to-clean straw as disclosed in claim 1, wherein the protrusions (111) are triangular.
4. The easy-to-clean straw as disclosed in claim 1, wherein the protrusions (111) are square.
5. The easy-to-clean straw as disclosed in claim 1, wherein the protrusions (111) are semicircular.
6. The easy-to-clean straw as disclosed in claim 1, wherein the protrusions (111) are polygonal.
7. The easy-to-clean straw as disclosed in claim 1, wherein the outer tube wall (100) has a cross sectional outline of a circular shape or a textured shape.

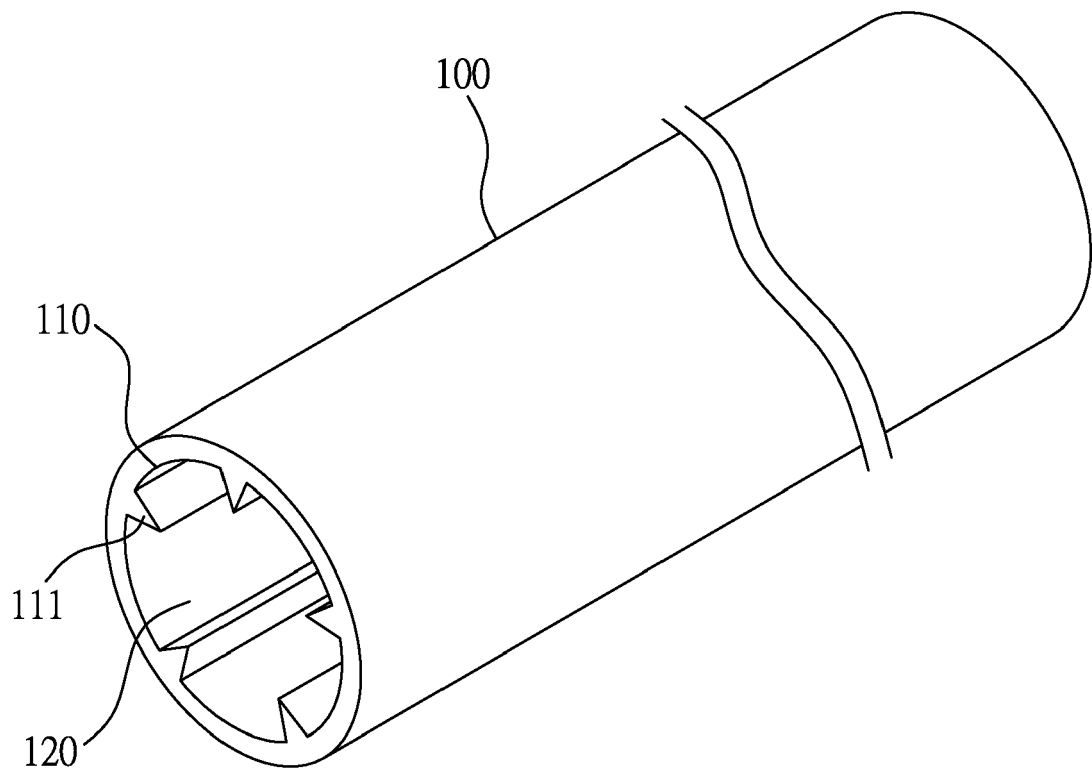


FIG. 1

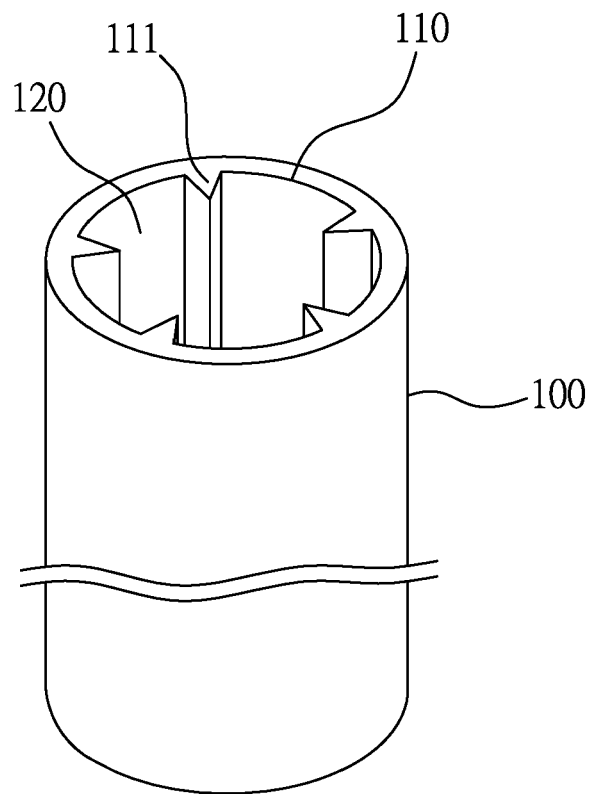


FIG. 2

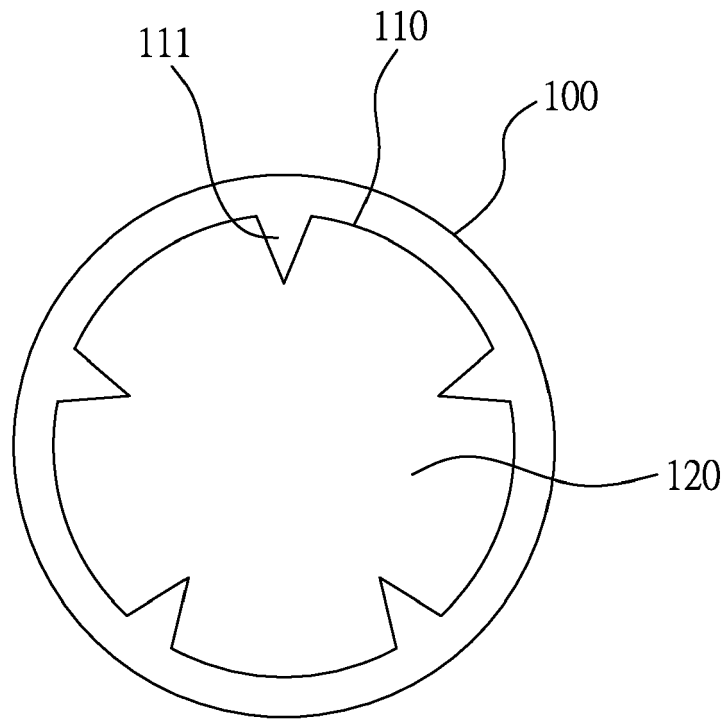


FIG. 3

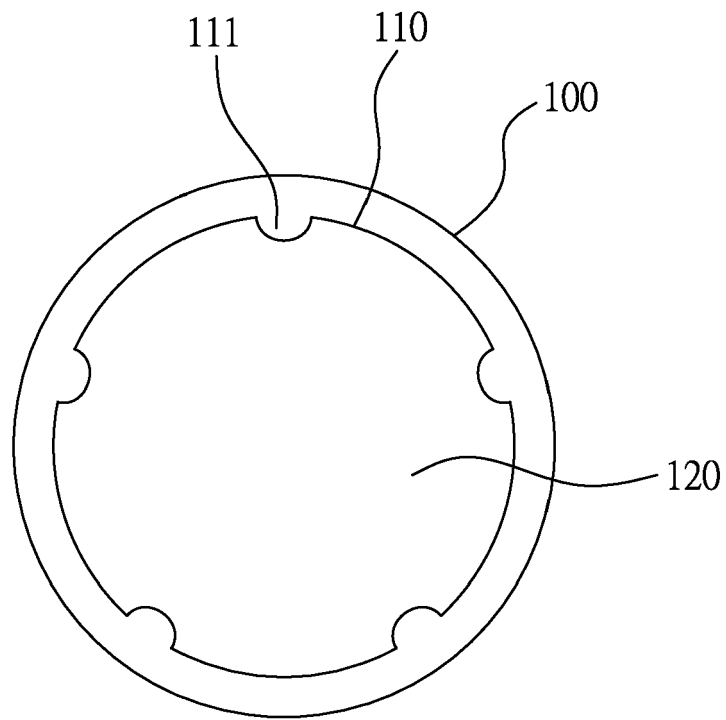


FIG. 4

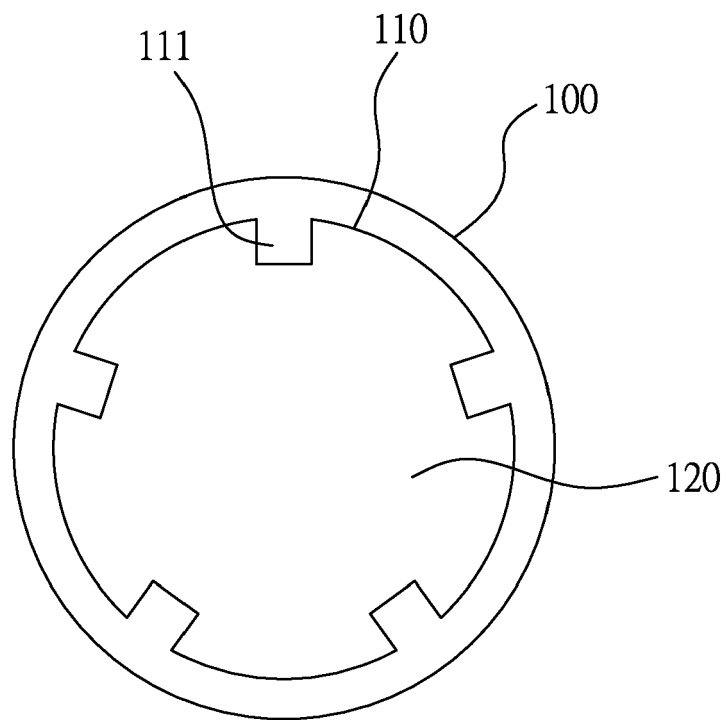


FIG. 5



EUROPEAN SEARCH REPORT

Application Number

EP 21 20 1900

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2014/252115 A1 (TOEFFERT CHRISTOPHER RAY [US]) 11 September 2014 (2014-09-11) * paragraphs [0006] - [0041]; figures * -----	1-7	INV. A47G21/18
X	CN 210 276 774 U (WU ZHUBIAO) 10 April 2020 (2020-04-10) * paragraphs [0006] - [0025] * -----	1-7	

TECHNICAL FIELDS SEARCHED (IPC)

A47G

The present search report has been drawn up for all claims

1

Place of search

The Hague

Date of completion of the search

23 March 2022

Examiner

Van Bastelaere, Tiny

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 20 1900

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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23-03-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2014252115 A1	11-09-2014	NONE	

CN 210276774 U	10-04-2020	CN 210276774 U	10-04-2020
		WO 2021000559 A1	07-01-2021

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- TW 1674868 [0004]