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(72) Inventors:
• **ZHAO, Pingcai**
Jinhua City, Zhejiang 322000 (CN)
• **YU, Kaifeng**
Jinhua City, Zhejiang 322000 (CN)

(74) Representative: **Berkkam, Ayfer**
Berkkam Patent Consulting
Büklüm Sokak, No. 5/16-3
06680 Kavaklıdere Ankara (TR)

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(71) Applicant: **Mengte Commodity Co., LTD**
322000 Jinhua City, Zhejiang (CN)

(54) **PAPER STRAW CAPABLE OF NINETY-DEGREE BEND**

(57) A paper straw capable of a ninety-degree bend is compositely formed by spirally rolling a paper strip and trimming two ends of the rolled paper strip. One end of the straw is evenly configured with eight to twelve annular grooves by pressing. The paper strip is formed by combining a first paper layer, a second paper layer, and a third paper layer, so that the straw would not get soft during use. By configuring a plurality of annular grooves with a predetermined interval, the straw is capable of being fully bent by ninety degrees without significantly reducing the inner diameter of the straw at the bent region. The paper straw can be fully degraded after use, so no plastic pollution will be caused, and puts less pressure on the environment. Therefore, the paper straw can effectively replace the plastic straw used in the market.

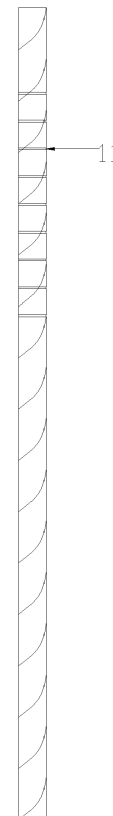


FIG. 1

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Description

Technical Field

[0001] The present invention relates to the technical field of straws, in particular to the technical field of paper straws capable of ninety-degree bends.

Background

[0002] The straws are divided into two types, i.e. vertical and flexible. The vertical straw may have a single tube structure or a telescopic tube structure. The flexible straw is relatively convenient for drinking and has a large market share. At present, most of the food-grade beverage drinking straws in the market are made of plastics. Although the plastic straws are convenient to use, the discarded plastic straws after use are difficult to recycle due to their small sizes. Moreover, since most of the plastic straws are nondegradable, puts a great pressure on the environment. Compared with plastic straws, paper straws not only can be recycled and reduce plastic pollution, but also have more refined and beautiful appearance with the improvement of modern technology. The paper straws are very suitable for occasions such as festival parties, etc. However, it is difficult for paper straws to achieve a ninety-degree bend, which brings inconvenience to consumers.

Summary

[0003] The objective of the present invention is to solve the problems in the prior art, and provide a paper straw capable of a ninety-degree bend. The paper straw is made by spirally rolling a paper strip combined by three paper layers having different gram weights, so that the straw would not get soft during use. Subsequently, the paper straw is configured with a plurality of annular grooves with a predetermined interval to make the straw capable of being bent by ninety degrees without significantly reducing the inner diameter of the straw at the bent region. The paper straw can be fully degraded after use, so no plastic pollution will be caused, and puts less pressure on the environment. Therefore, the paper straw can effectively replace the plastic straw used in the market.

[0004] In order to achieve the above objective, the present invention provides a paper straw capable of a ninety-degree bend, which is compositely formed by spirally rolling a paper strip and trimming two ends of a rolled paper strip. One end of the paper straw is evenly provided with eight to twelve annular grooves by pressing. The paper strip is formed by combining a first paper layer, a second paper layer, and a third paper layer.

[0005] Preferably, a width of the paper strip ranges from 1.3 cm to 1.5 cm.

[0006] Preferably, the paper straw has a circular cross section, the third paper layer is located outside the second paper layer, and the second paper layer is located

outside the first paper layer. A gram weight of the first paper layer is 120 g/m², a gram weight of the second paper layer is 120 g/m², and a gram weight of the third paper layer is 60 g/m².

[0007] Preferably, an outer side of the third paper layer is printed with color and pattern.

[0008] Preferably, the annular grooves are arranged starting from a position 2.0 cm-2.2 cm away from an end of the straw and extending towards a middle portion of the straw.

[0009] Preferably, an interval of the annular grooves ranges from 0.6 cm to 0.7 cm.

[0010] The present invention has the following advantages. The paper straw of the present invention is made by spirally rolling a paper strip combined by three paper layers having different gram weights, so that the straw would not get soft during use. Also, the paper straw is configured with a plurality of annular grooves with a predetermined interval to make the straw capable of being bent by ninety degrees without significantly reducing the inner diameter of the straw at the bent region. The paper straw can be fully degraded after use, so no plastic pollution will be caused, and puts less pressure on the environment. Therefore, the paper straw can effectively replace the plastic straw used in the market.

[0011] The characteristics and advantages of the present invention will be described in detail through the embodiments with reference to the drawings.

Brief Description of the Drawings

[0012]

FIG. 1 is a front view of a paper straw capable of a ninety-degree bend of the present invention; and FIG. 2 is a top view of a paper straw capable of a ninety-degree bend of the present invention.

[0013] In the drawings: 11-annular groove, 12-first paper layer, 13-second paper layer, 14-third paper layer.

Detailed Description of the Embodiments

[0014] Referring to FIG. 1 and FIG. 2, the present invention provides a paper straw capable of a ninety-degree bend, which is compositely formed by spirally rolling a paper strip and trimming two ends of a rolled paper strip. One end of the paper straw is evenly provided with eight to twelve annular grooves 11 by pressing. The paper strip is formed by combining a first paper layer 12, a second paper layer 13, and a third paper layer 14. A width of the paper strip ranges from 1.3 cm to 1.5 cm. The paper straw has a circular cross section, the third paper layer 14 is located outside the second paper layer 13, and the second paper layer 13 is located outside the first paper layer 12. A gram weight of the first paper layer 12 is 120 g/m², a gram weight of the second paper layer 13 is 120 g/m², and a gram weight of the third paper layer

14 is 60 g/m². An outer side of the third paper layer 13 is printed with color and pattern. The annular grooves 11 are arranged starting from a position 2.0 cm-2.2 cm away from an end of the straw and extending towards a middle portion of the straw. An interval of the annular grooves 11 ranges from 0.6 cm to 0.7 cm.

[0015] The working process of the present invention is as follows.

[0016] In the working process of the paper straw capable of a ninety-degree bend of the present invention, the end of the straw away from the annular grooves 11 is the end to be inserted into the beverage, and the end of the straw near the annular grooves 11 is the end for sucking. The straw can be gradually bent along the plurality of annular grooves 11 at the position close to the sucking end. Preferably, nine annular grooves 11 are provided, so that the straw would not get broken or flat when the straw is sufficiently bent by ninety degrees. As a result, the change of the inner diameter of the straw at the bent region is reduced.

[0017] The paper straw of the present invention is made by spirally rolling a paper strip combined by three paper layers having different gram weights, so that the straw would not get soft during use. Also, the paper straw is configured with a plurality of annular grooves with a predetermined interval to make the straw capable of being bent by ninety degrees without significantly reducing the inner diameter of the straw at the bent region. The paper straw can be fully degraded after use, so no plastic pollution will be caused, and puts less pressure on the environment. Therefore, the paper straw can effectively replace the plastic straw used in the market.

[0018] The above-mentioned embodiments are merely intended to illustrate the present invention rather than limit the present invention. Any solution derived by simply modifying the present invention should be considered as falling within the scope of the present invention.

Claims

1. A paper straw capable of a ninety-degree bend, **characterized in that**, the paper straw is compositely formed by spirally rolling a paper strip and trimming two ends of a rolled paper strip; one end of the paper straw is evenly provided with eight to twelve annular grooves (11) by pressing; and the paper strip is formed by combining a first paper layer (12), a second paper layer (13), and a third paper layer (14).
2. The paper straw capable of a ninety-degree bend of claim 1, **characterized in that**, a width of the paper strip ranges from 1.3 cm to 1.5 cm.
3. The paper straw capable of a ninety-degree bend of claim 1, **characterized in that**, the paper straw has a circular cross section, the third paper layer (14) is located outside the second paper layer (13), and the

second paper layer (13) is located outside the first paper layer (12); a gram weight of the first paper layer (12) is 120 g/m², a gram weight of the second paper layer (13) is 120 g/m², and a gram weight of the third paper layer (14) is 60 g/m².

4. The paper straw capable of a ninety-degree bend of claim 3, **characterized in that**, an outer side of the third paper layer (13) is printed with color and pattern.
5. The paper straw capable of a ninety-degree bend of claim 1, **characterized in that**, the annular grooves (11) are arranged starting from a position 2.0 cm-2.2 cm away from an end of the paper straw and extending towards a middle portion of the paper straw.
6. The paper straw capable of a ninety-degree bend of claim 1, **characterized in that**, an interval of the annular grooves (11) ranges from 0.6 cm to 0.7 cm.

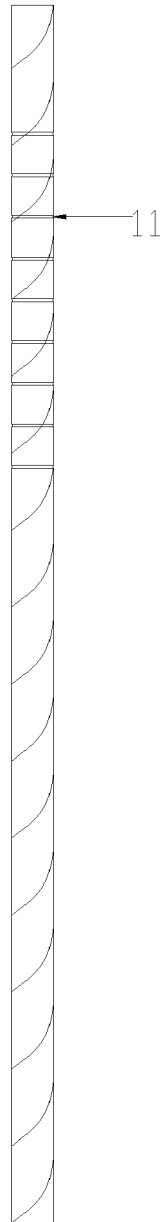


FIG. 1

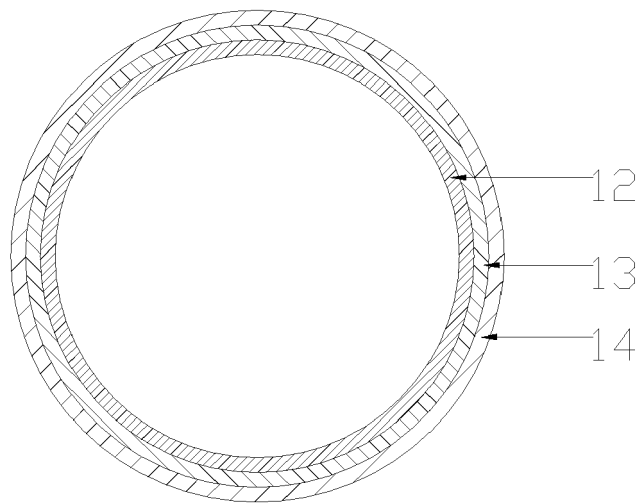


FIG. 2



EUROPEAN SEARCH REPORT

 Application Number
 EP 18 20 9500

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 March 2019	Examiner Ponsaud, Philippe
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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 EPO FORM 1503 03/82 (P04C01)

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

EP 18 20 9500

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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