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(54) Title: INTERLOCKING ASSEMBLY

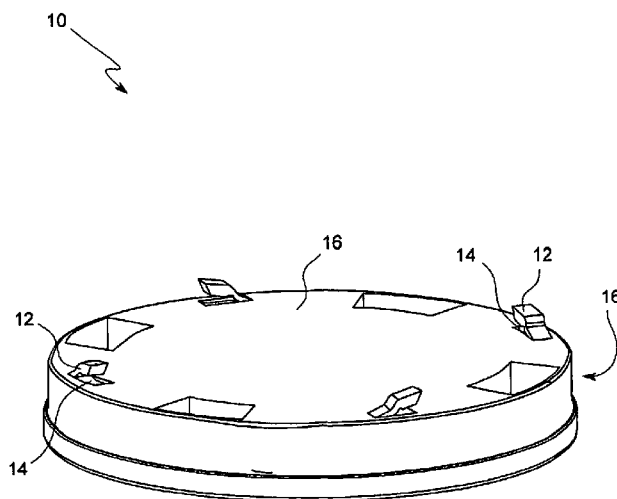


FIG. 1

(57) Abstract: Disclosed is an interlocking assembly comprising a pair of first and second interlocking members that are adapted to be rotably interlocked together. Each interlocking member comprises a horizontal engaging surface comprising a plurality of elongate, oblique projections extending therefrom, the projections pointed toward one common direction either towards right or left, and an open cavity wherein, each projection extends from a longitudinal edge of the cavity. As the first and second interlocking members are pressed against one another such that, the engaging surfaces face one another and the projections of the first and second interlocking members are disposed in opposing directions, rotating the first interlocking member with respect to the second interlocking member in a locking direction causes the projections of the first and second interlocking members to slide into the cavities of the second and first cavities respectively so as to interlock the first and second interlocking members.

**INTERLOCKING ASSEMBLY****BACKGROUND**5 **FIELD OF THE INVENTION**

The present invention relates to packaging and more particularly, an interlocking assembly teaching a mechanism for interlocking two sliding flat surfaces such that, sliding in one direction beyond this point is restricted.

10 Cardboard is a generic term for a heavy-duty paper of various strengths, ranging from a simple arrangement of a single thick sheet of paper to complex configurations featuring multiple corrugated and un-corrugated layers. Assembling or manipulating cardboard to fit the products it carries forms the crux of packaging. While, one of the simplest arrangements or  
15 manipulations of the cardboards is a simple commonplace cardboard box, complex assemblies of cardboard are known in the art, which cater to different form factors of products including shapes and sizes. Traditionally, packaging, when seen as a product, is rigid in terms various mechanical mechanisms employed therewith. However, today, with all the  
20 technological advancement at one's disposal, the kind of packaging that encompasses various mechanical mechanisms as the products they carry is a welcome addition to the art.

**Summary**

25 The present invention comprises an interlocking assembly comprising a pair of first and second circular interlocking members, each of which comprising a planar engaging surface whereon are disposed a plurality of open, rectangular cavities. An elongate, oblique projection extends from a longitudinal edge of each cavity whereby, a bottom portion of the  
30 projection, in a way, serves as a roof for the cavity. In order to interlock the first and second interlocking members, the first and second interlocking members, while being pressed against each other, are rotated with respect

to one another in a locking direction. As the first and second interlocking members are rotated in the locking direction, the projections slide against the abutting engaging surface and eventually enter into the cavity till the projection is stopped either by the longitudinal extremity of the cavity or the length of the projection itself. At this point, the first and second interlocking members are interlocked.

Other objects and advantages of the embodiments herein will become readily apparent from the following detailed description taken in conjunction with the accompanying drawings.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**FIG. 1**, according to an embodiment of the present invention, is an illustration of a perspective view of an interlocking member.

**FIG. 2**, according to an embodiment of the present invention, is an illustration of a top view of an interlocking member.

**FIG. 3**, according to an embodiment of the present invention, is an illustration of a perspective view of a projection.

**FIG. 4 through 6**, according to an embodiment of the present invention, are sequential illustrations of the top and bottom interlocking members being interlocked with one another.

### **FIGURES – REFERENCE NUMERALS**

**10** – Interlocking Member

**12** – Projection

**14** – Cavity

**16** – Engaging Surface

5 **18** – Tip

**20** – Upper Surface of the Tip

**22** – Locking Groove

10

### Detailed description

In the following detailed description, a reference is made to the accompanying drawings that form a part hereof, and in which the specific embodiments that may be practiced is shown by way of illustration. These  
15 embodiments are described in sufficient detail to enable those skilled in the art to practice the embodiments and it is to be understood that the logical, mechanical and other changes may be made without departing from the scope of the embodiments.

20 The present invention comprises an interlocking assembly, which basically teaches a novel interlocking mechanism employed for rotably and slidably establishing a surface interlock between a pair of first and second interlocking members. Referring to **FIGs. 1** and **2**, each interlocking member **10** comprises a circular member bound by first and second planar  
25 surfaces and a circular circumference wherein, the first planar surface will hereinafter be referred to as engaging surface **16**. The first and second interlocking members **10** interlock one another by rotably sliding against one another in a locking direction at which point, the first and second interlocking members **10** abut one another about the engaging surfaces **16**  
30 thereof. In order to unlock the interlocked interlocking members **10**, the interlocking members are rotated in an opposite unlocking direction.

Referring to **FIGs. 1** and **2**, each interlocking member **10** comprises four

rectangular open cavities 14 disposed on the engaging surface 16. Each cavity 14 is paired with another cavity 14 such that, each pair of cavities 14 are opposingly-disposed and the lines centrally joining the pair of cavities 14 are mutually perpendicular. As can be appreciated from the referred drawings, the cavities 14 are located closer to the edge of the engaging surface 16. A rectangular opening flush with the engaging surface 16 permits ingress into and egress out of the cavity. Each rectangular opening is defined by a pair of opposingly-disposed lateral and longitudinal edges. More particularly, the pair of lateral edges comprises a pair of proximal and distal lateral edges. The cavity extends between a wall flush with the distal edge and a dead end extending beyond the proximal edge. The floor of the cavity 14 comprises an elongate ledge (not shown) of uniform semi-circular cross-section wherein, the utility of the ledge will become apparent from the following body of text.

15

Referring to **FIGs. 1** through **3**, each interlocking member 10 further comprises four elongate projections 12 extending obliquely from a proximal lateral edge of the opening of a cavity 14. The width of the projection 12 is substantially equivalent to that of the cavity 14 for reasons that will be apparent from the following body of text. The tip 18 of the projection 12, which, when viewed from the side thereof, to an extent resembles an arrow head. More particularly, the tip 18 proceeds from a locking groove 22 of uniform semi-circular cross-section disposed on an underside of the projection 12.

25

Referring to **FIGs. 4** through **6**, in order to assemble the first and second interlocking members 10, with the engaging surfaces 16 of the first and second interlocking members 10 facing each other, the first and second interlocking members 10 are pressed against one another or, as can be appreciated from the referred drawings, the first interlocking member 10 is placed atop the second engagement member 10. At this point, the top surface 20 of the projections 12 of the first interlocking member 10 abuts the engaging surface of the second interlocking member 10 and the

30

projections **12** of the second interlocking member **10** abuts the engaging surface of the first interlocking member **10**. As the first and second interlocking members **10**, while being pressed against each other, are rotated with respect to one another in a locking direction, the top surfaces  
5 **20** of the projections **12** slide against the abutting engaging surface and eventually snugly enter into the cavity **14** till the projection **12** is stopped either by the longitudinal extremity of the cavity **14** or the length of the projection **12** itself. At this point, the first and second interlocking members **10** are interlocked as the ledges are received within the locking  
10 grooves **22**. In order to unlock the interlocked first and second interlocking members **10**, either the first or the second interlocking member **10** is rotated in the opposite unlocking direction causing the projections **12** to slide out of the cavities **14** thereby rendering the first and second interlocking members **10** unlocked. Notably, while unlocking, a little  
15 resistance is offered owing to the assemblage of the locking grooves **22** and the respective ledges.

The foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying  
20 current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed  
embodiments. Therefore, while the embodiments herein have been  
25 described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments wherein can be practiced with modification within the spirit and scope of the appended claims.

**Claims**

1. An interlocking assembly comprising a pair of first and second interlocking members (10) each of which comprising a substantially planar engaging surface (16), each engagement surface (16) comprising:
- 5
- (a) a plurality of elongate, oblique projections (12) extending therefrom, the projections (12) pointed toward one common direction either towards right or left; and
- 10
- (b) an open cavity (14) disposed therewithin, the opening of the cavity flush therewith, each projection (12) extending from a distal lateral edge of the opening; wherein, as the first and second interlocking members (10) are pressed against each other such that, the engaging surfaces (16) are opposingly-disposed with respect to one another and the projections (12) of the first and second interlocking members (10) are disposed in opposing directions, rotating the first interlocking member (10) with respect to the second interlocking member (10) in a locking direction causes the projections (12) of the first and second interlocking members (10) to slide into the cavities (14) of the second and first cavities (14) respectively so as to interlock the first and second interlocking members (10) together and wherein, upon unlocking, rotating the first interlocking member (10) with respect to the second unlocking member (10) in an opposite unlocking direction causes the projections (12) of the first and second interlocking members (10) to slide out of the cavities (14) of the second and first interlocking members (10) respectively thereby causing the first and second interlocked interlocking members (10) to unlock.
- 15
- 20
- 25
- 30
2. The assembly of claim 1 wherein, the projections (12) are arranged in a circular layout.

3. The assembly of claim 1 wherein, the cavity (14) extends between a proximal edge of opening and a dead end, which extends the beyond the distal edge of the opening.
- 5 4. The assembly of claim 1 wherein, each projection (12) is integral with the corresponding interlocking member (10).
5. The assembly of claim 1 wherein, the interlocking member (10) comprises a circular member.
- 10 6. The assembly of claim 1 wherein, the tip of each projection (12) comprises a planar surface that abuts the planar engaging surface (16) of the other interlocking member (10) when the other interlocking member (10) is in contact in the aforesaid manner; the planar surface of an interlocking member (10) being parallel to the engaging surface (16) from which the  
15 corresponding projection (12) extends.
7. The assembly of claim 6 wherein, each projection (12) comprises a locking groove (22) that engages a ledge disposed within the cavity (14) as the  
20 projection (12) is locked within the cavity (14).
8. The assembly of claim 7 wherein, the locking groove (22) and the ledge are parallel to the lateral edge.
- 25 9. The assembly of claim 1 wherein, the plurality of projections (12) comprise four projections (12).
10. The assembly of claim 9 wherein, the four projections (12) comprise two pairs of opposingly disposed projections (12).
- 30 11. The assembly of claim 1 wherein, the engaging surfaces (16) of the first and second interlocking members (10) abut one another upon interlocking.



12. The assembly of claim 1 wherein, each cavity (14) is rectangular.
13. The assembly of claim 1 wherein, the width of each cavity  
5 (14) is substantially equivalent to that of the projection (12)  
so as to snugly receive the corresponding projection (12) therewithin.
14. The assembly of claim 1 wherein, the opening is rectangular.
- 10 15. An interlocking assembly comprising a pair of first and second circular  
interlocking members  
(10) each of which comprising a substantially planar engaging surface  
(16), the engaging surfaces (16) adapted to abut one another upon  
interlocking, each engagement surface (16) comprising:  
15 a) a plurality of elongate, oblique projections (12) extending integrally  
therefrom, the projections (12) pointed toward one common direction  
either towards right or left, the projections (12) arranged in a circular  
layout; and  
b) an open cavity (14) disposed therewithin, the opening of the cavity  
20 (14) flush therewith, each projection (12) extending from a longitudinal  
edge of the cavity (14), a portion of the projection (12) serving as a  
roof for the for a portion of the cavity (14); wherein, as the first and  
second interlocking members (10) are pressed against each other  
such that, the engaging surfaces (16) are opposingly-disposed with  
25 respect to one another and the projections (12) of the first and second  
interlocking members (10) are disposed in opposing directions, rotating  
the first interlocking member (10) with respect to the second  
interlocking member (10) in a locking direction causes the projections  
(12) of the first and second interlocking members (10) to snugly slide  
30 into the cavities of the second and first cavities (14) respectively so as  
to interlock the first and second interlocking members (10) together  
and wherein, upon unlocking, rotating the first interlocking member (10)  
with respect to the second interlocking member (10) in an opposite

unlocking direction causes the projections (12) of the first and second interlocking members (10) to slide out of the cavities (14) of the second and first interlocking members (10) respectively thereby causing the first and second interlocked interlocking members (10) to unlock.

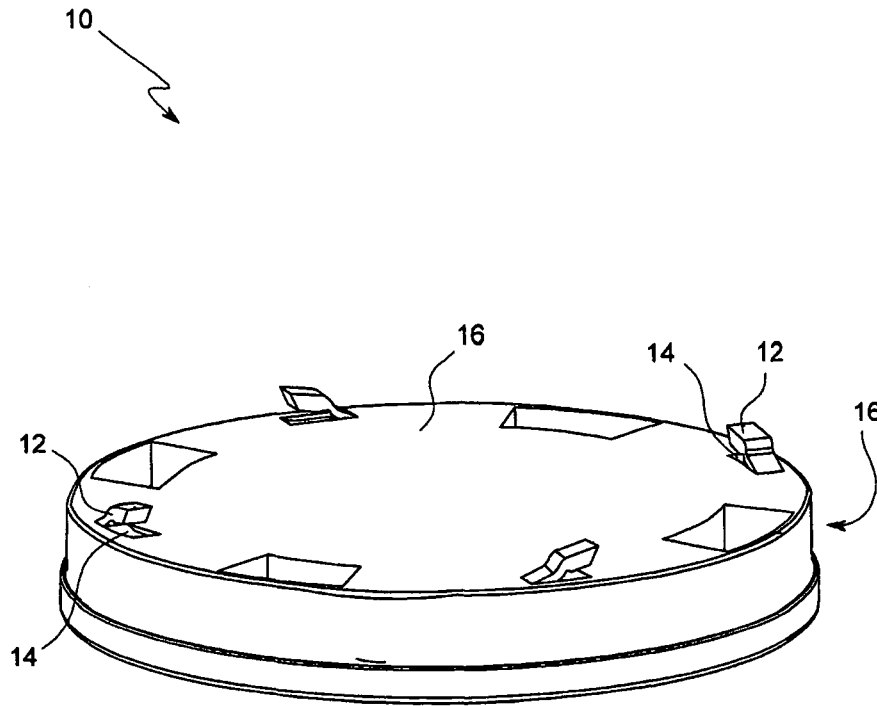


FIG. 1

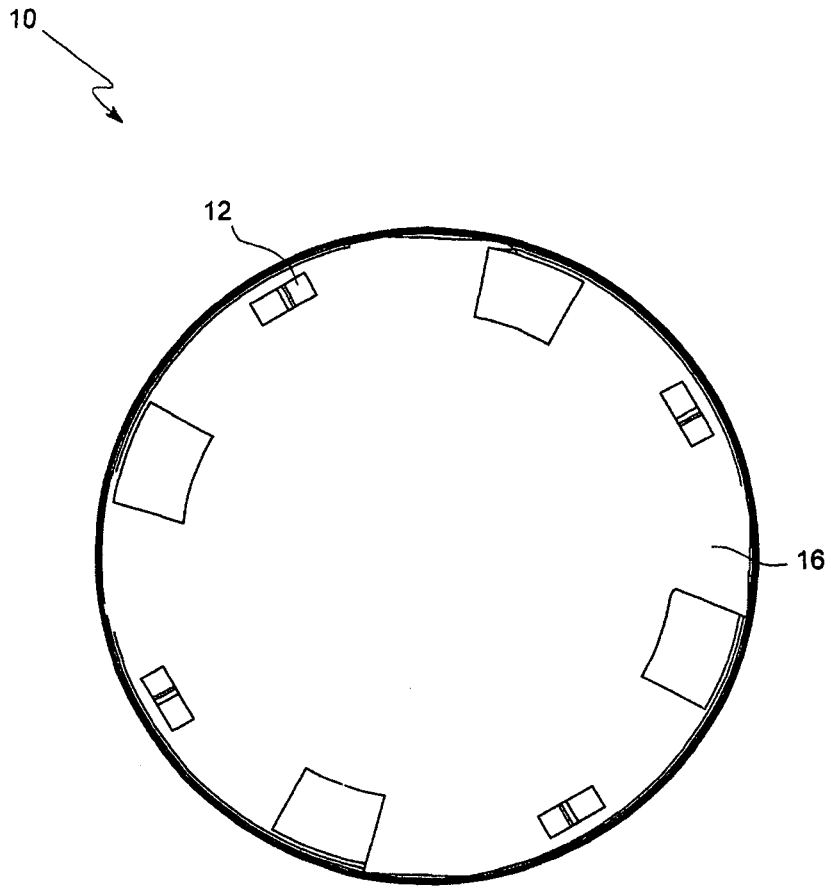


FIG. 2

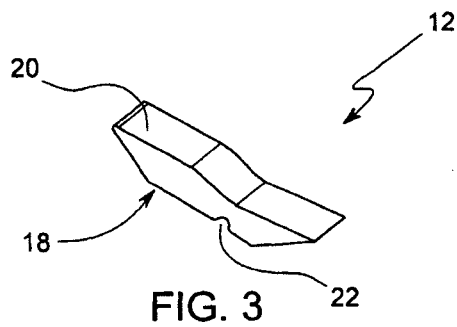


FIG. 3

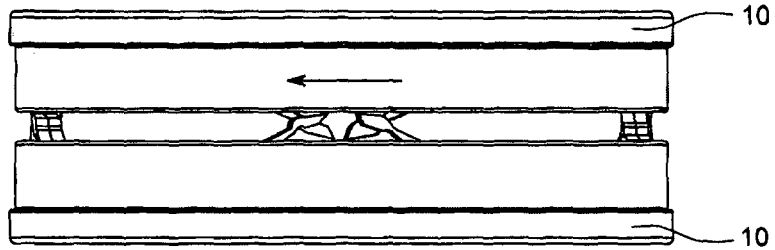


FIG. 4

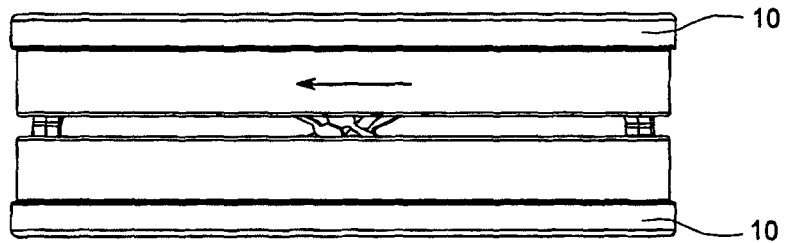


FIG. 5

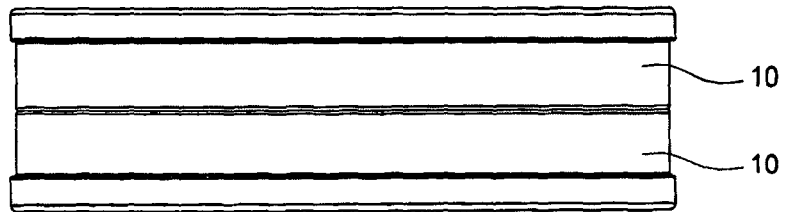


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No  
PCT/DK2016/000010

A. CLASSIFICATION OF SUBJECT MATTER  
INV. F16B5/07  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 358 795 A (ALEXANDER DJIDICS ET AL) 26 September 1944 (1944-09-26) the whole document -----	1-15

Further documents are listed in the continuation of Box C.

See patent family annex.

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Date of the actual completion of the international search  13 May 2016	Date of mailing of the international search report  25/05/2016
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2358795	A	26-09-1944	NONE
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