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(11) Publication number:

0 416 956 A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **90309861.4**

(51) Int. Cl.⁵: **B65D 85/32, B65D 50/00**

(22) Date of filing: **10.09.90**

(30) Priority: **08.09.89 GB 8920370**

(43) Date of publication of application:
13.03.91 Bulletin 91/11

(84) Designated Contracting States:
ES FR GB

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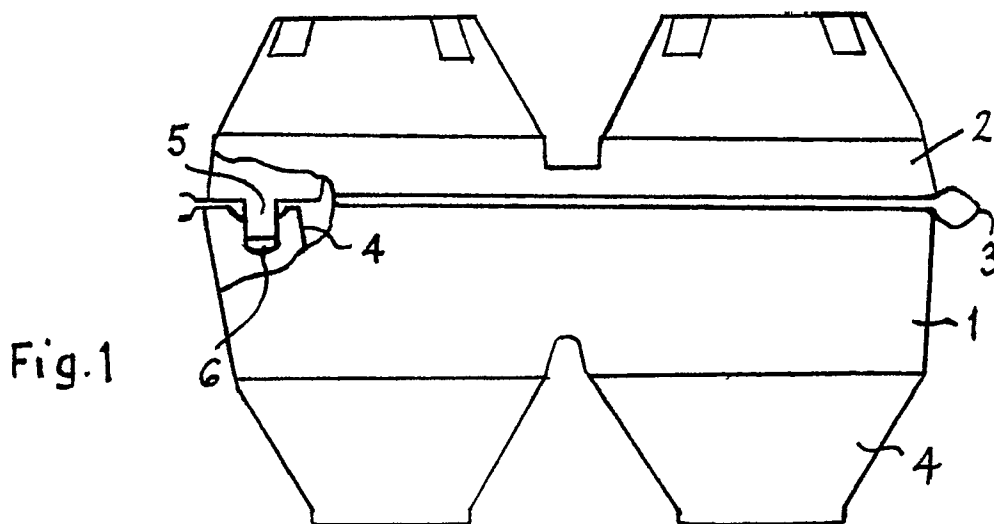
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(54) **Fastening device for boxes or packs for packaging eggs, fruit or other articles.**

(57) A box or pack for packaging eggs, fruit or other articles comprises a hollow base part (1) for receiving one or more articles and a hollow cover part (2) which is inverted over the base part to close the latter. The two parts are hinged together along mutually adjacent rims so that the cover part can be folded into its closed position about the hinge (3) and the cover part is fastened in the closed position by fastening devices (5,6) formed respectively on the two parts adjacent their rims opposite the hinge. Each fastening device comprises an open mouth

cavity (6), which is substantially square in plan, formed in the base part (1) and a hollow stud (5) of substantially cylindrical configuration formed on the cover part (2) so as to be inserted into the cavity (6) through the open mouth thereof. The stud (5) has a diameter substantially equal to the length of a side of the square cavity. When the stud (5) is inserted into the cavity (6), it is an interference fit with the cavity at four positions, that is, on all four sides and provides a positive securing action.



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FASTENING DEVICE FOR BOXES OR PACKS FOR PACKAGING EGGS, FRUIT OR OTHER ARTICLES

The present invention relates to boxes or packs for packaging eggs, fruit or other articles of the type in which a hollow base part for receiving one or more articles is closed by a cover part which is inverted over the base part and closes the open top of the latter. The two parts are formed from thin plastics material and may or may not be formed as a one piece moulding with an integral hinge along one edge. More particularly, the invention relates to fastening devices for fastening the two parts of such boxes or packs together in their closed positions.

It is known to fasten together the two parts of plastics eggboxes of the type described above with press stud-type fastening devices in which a hollow plastics stud moulded integrally with one part is an interference fit in a correspondingly shaped cavity formed in the other part. Designs of such press stud-type fastening devices hitherto used in eggboxes have varied ineffectiveness from difficult to close and open to an easy fit with poor closure retaining properties. This is mainly because of the close tolerances to which the male and female elements of the fastener must be formed in order to produce a satisfactory fastening and, additionally because of unavoidable production thickness variations in the plastics sheet material from which eggboxes are formed.

It is an object of the present invention to provide an improved fastening device for boxes or packs of the type referred to above in which engagement of the male and female elements of the fastening device is facilitated whilst providing a secure fastening having good retention properties.

According to the present invention, the fastening device comprises an open-mouth cavity, which is substantially square in plan, formed in one of the parts of the box or pack and a hollow stud of substantially cylindrical configuration formed on the other part so as to be inserted into the cavity through the mouth thereof, said stud having a diameter substantially equal to the length of a side of the square cavity. Hence, when the stud is inserted into the cavity, it is an interference fit with the cavity at four positions, that is on all four sides, and provides a positive securing action.

Preferably, the mouth of the cavity includes a converging lead-in portion, conveniently, of concave configuration. Such a lead-in guides the stud into the mouth of the cavity and facilitates its engagement with the cavity. It enables the cavity to expand upon insertion of the stud and on withdrawal, the lead-in portion tends to straighten, thereby constricting the mouth of the cavity and resisting retraction of the stud.

In hitherto known press-stud fastening devices, the male stud has a lead-in taper at its leading end and, when the stud is presented to a cooperating fastening cavity, the latter may not expand to permit the stud to enter.

With the present invention, the stud, itself, does not require a lead-in taper so that it can be formed with a much more substantial lobe at the corner of its leading end, thereby resulting in a much stronger locking effect between the cavity and the stud. The male forming pin on which the stud is moulded does not require a chamfer, thereby resulting in a good blocking of material upon moulding of the stud.

An advantage of the invention is that the fastening device may be designed to exhibit evidence of tampering, if such a property is required.

The invention is particularly suitable for use with plastics boxes or packs in which a base part having mutually parallel rows of article receiving pockets is formed in one piece with a hollow cover part, the parts being hinged together along mutually adjacent rims substantially parallel to the rows of article receiving pockets so that the cover part can be folded about the hinge from an open position to a closed position in which it is inverted over the base part and closes the open, upper ends of the pockets. The cover part may be fastened in its closed position by one or more fastening devices of this invention formed respectively on the two parts adjacent their rims opposite the hinge.

In order that the present invention may be more readily understood, reference will now be made to the accompanying drawings, in which:-

Figure 1 is an end view of an eggbox embodying the present invention and partially cut away to illustrate the fastening device,

Figures 2 and 3 are fragmentary views respectively illustrating a plan and a section through the female cavity of the fastening device, and

Figure 4 is a fragmentary sectional view of the fastening device showing the stud and cavity engaged to effect the fastening.

Referring to Figure 1, the eggbox is a one-piece plastics moulding and is thermo-formed from plastics sheet material. It comprises a hollow base part 1 and a hollow cover part 2 both of generally rectangular shape in plan and joined together along mutually adjacent longitudinal rims by integral web portions serving as a hinge 3 about which the cover part may be folded over the base part. In a conventional manner, the base part 1 comprises six egg-receiving pockets 4 disposed in mutually parallel rows extending longitudinally of the base part, that is, parallel to the axis of the hinge 3 with the

pockets of the two rows arranged side-by-side. Conventionally, also, the hollow cover part 2 is configured so as to accommodate the projecting top portions of eggs seated in the pockets 4 in the base part when the cover is folded about the hinge 3 into an inverted position over the base part, as shown in Figure 1.

On its inside adjacent the rim opposite the hinge 3, the cover part 2 is moulded with two small downwardly projecting cylindrical studs 5 (only one being illustrated) which are spaced apart along the rim and are arranged to engage in cooperating cavities 6 moulded in opposing portions of the base part so as to fasten the two parts in their closed positions. As shown in Figures 2 and 3, the mouth 7 of each cavity 6 is of substantially square shape in plan and is joined to adjacent upper surface portions 8 of the base part 1 by a lead-in portion 9 of concave section. Each stud 5 is of cylindrical configuration and has a diameter substantially equal to the length of a side of the square cavity 6.

When the cover 2 is closed, the studs 5 are precisely guided into the mouths of the cooperating cavities 6 by the concave lead-in portions 9, and the studs fit into and engage with the cavities (Figure 4). Each cavity 6 readily expands to enable its cooperating stud to engage therewith and the latter is an interference fit with the cavity at four positions, that is, at each of the cavity side walls, so as to provide a secure fastening. Opening of the cover part 2, whether intentional or not, is resisted by the construction of the fastening devices 5,6 in that upon withdrawing a stud 5, the concave lead-in portion 9 tends to straighten towards a horizontal position, thereby constricting the cavity mouth 7 (as illustrated in Figure 4) and further resisting retraction of the stud from the cavity. Because each stud does not require a lead-in portion to assist in guiding it into the mouth 7 of its associated cavity upon closing of the cover part, it can be moulded with a more substantial lobe at the corner 10 adjacent its leading end 11 so as to provide a strong zone which is resistant to collapse and withdrawal of the stud from the cavity.

The construction is such that any tampering with the eggbox by way of an attempt to open the cover part 2 is readily evident by reason of damage to or destruction of the fastening devices 5,6.

Whilst a particular embodiment has been described, it will be understood that modifications can be made without departing from the scope of the invention. For example, the base and cover parts 1,2 may be formed separately, instead of in one piece, and a suitable array of fastening devices 5,6 may be provided in the two parts for retaining the cover part in its closed position on the base part when the cover part is fitted to the base part.

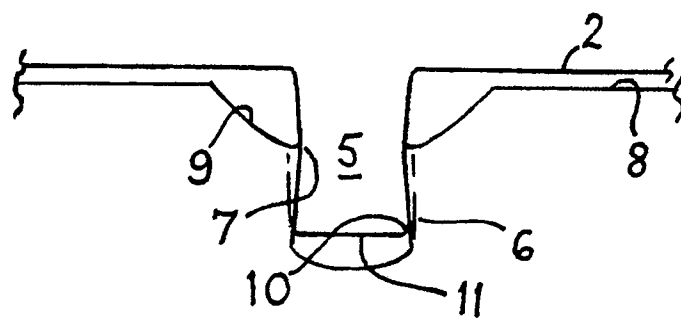
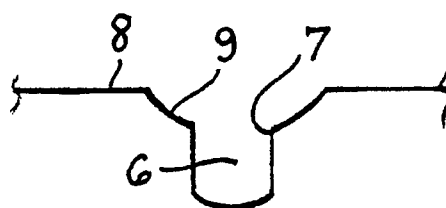
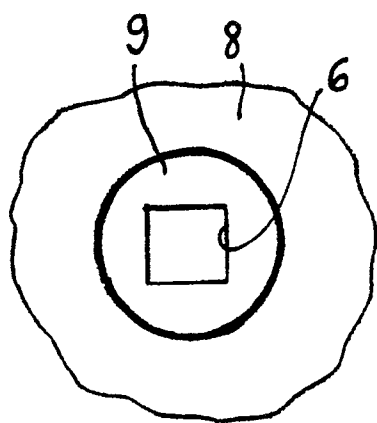
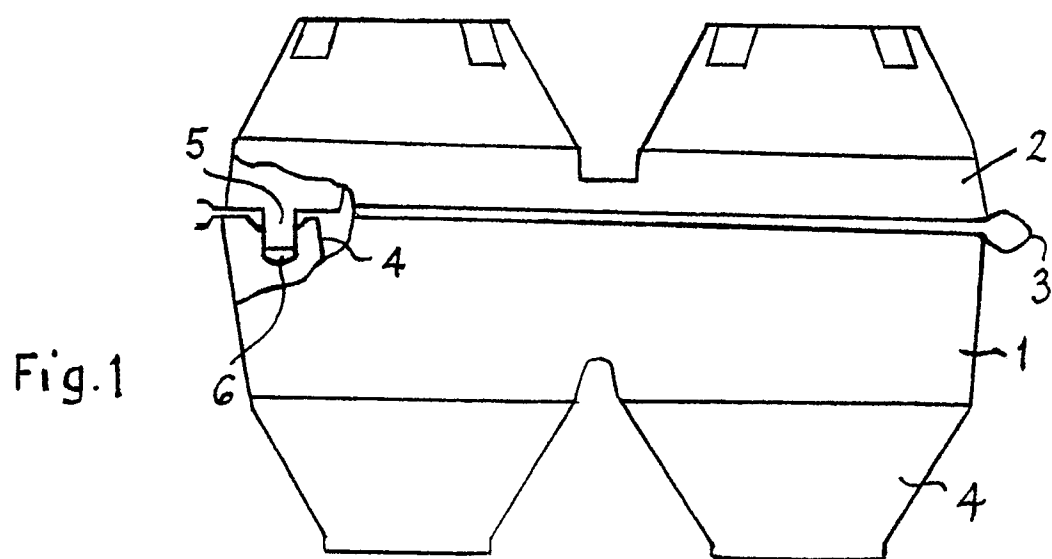
Claims

1. A box or pack for packaging eggs, fruit or other articles in which a hollow base part (1) for receiving one or more articles is closed by a cover part (2), and the two parts (1,2) are fastened together in their closed position by one or more fastening devices (5,6), characterised in that the or each fastening device comprises an open mouth cavity (6), which is substantially square in plan, formed in a one of the parts (1) of the box or pack, and a hollow stud (5) of substantially cylindrical configuration formed on the other part (2) so as to be inserted into the cavity (6) through the mouth (7) thereof, said stud (5) having a diameter substantially equal to the length of a side of the square cavity (6).

2. A box or pack according to claim 1, characterised in that the mouth (7) of the cavity (6) has a converging lead-in portion (9), conveniently, of concave configuration, such that the lead-in (9) guides the stud (5) into the mouth (7) of the cavity and facilitates its engagement with the cavity.

3. A box or pack according to claim 1 or 2, characterised in that the stud (5) is formed with a lobe at the corner (10) adjacent its lead-in end (11), whereby to provide a strong zone which is resistant to collapse and withdrawal of the stud from the cavity.

4. A box or pack according to any preceding claim, characterised in that the base part (1) is moulded in one piece with the cover part (2) and the parts are hinged together along mutually adjacent rims so that the cover part can be folded about the hinge (3) from an open position to a closed position in which it is inverted over the base part, said cover part (2) being fastened in its closed position by one or more of the fastening devices (5,6) moulded respectively on the two parts adjacent their rims opposite the hinge (3).





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EUROPEAN SEARCH REPORT

Application Number

EP 90309861.4

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	<u>DE - A - 2 021 350</u> (I.S.A.P.) * Totality * --	1	B 65 D 85/32 B 65 D 50/00
A	<u>GB - A - 1 114 219</u> (HOHNJEC) * Fig. 4-10 * --	1	
A	<u>DE - A1 - 2 826 444</u> (HINTEREGGER) * Fig. 4 * --	1	
A	<u>DE - C2 - 2 713 650</u> (SIEMENS AG) * Totality * ----	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 65 D 1/00 B 65 D 43/00 B 65 D 45/00 B 65 D 50/00 B 65 D 85/00 F 16 B 2/00 F 16 B 17/00 F 16 B 21/00
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 30-11-1990	Examiner MELZER
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			
I : 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			