(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number : **0 642 110 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number : **94306573.0**

(51) Int. Cl.[6] : **G09F 3/03**

(22) Date of filing : **07.09.94**

(30) Priority : **07.09.93 GB 9318515**

(43) Date of publication of application :
08.03.95 Bulletin 95/10

(84) Designated Contracting States :
DE ES GB IT NL SE

(71) Applicant : **Envopak Group Limited**
Planmail House
Edgington Way
Sidcup Kent, DA14 5BH (GB)

(72) Inventor : **Adamson, Donald**
Planmail House,
Edgington Way
Sidcup, Kent DA14 5BH (GB)
Inventor : **Arthur, Frank**
Planmail House,
Edgington Way
Sidcup, Kent DA14 5BH (GB)

(74) Representative : **Lewin, John Harvey**
Elkington and Fife
Prospect House
8 Pembroke Road
Sevenoaks, Kent TN13 1XR (GB)

(54) Security seal.

(57) According to the invention, there is provided a tamper evident security seal suitable for tying the neck of a bag or the like. The seal comprises a strap (1) having a free end and a housing (2) at its opposite end. The housing has a passage therethrough into one end of which the free end of the strap can be slidingly inserted and passed out through the other end of the passage so that the strap forms a loop. Teeth (8) project obliquely into the passage between its ends so as to engage with the strap inside the passage, the teeth being made of material which is hard relative to the material of the strap, whereby the teeth permit sliding insertion of the strap into the passage but resist sliding withdrawal therefrom. The end surfaces of the teeth (8) in engagement with the strap (1) form cutting edges, so that attempted forced withdrawal of the strap from the passage will cause the teeth to cut the strap.

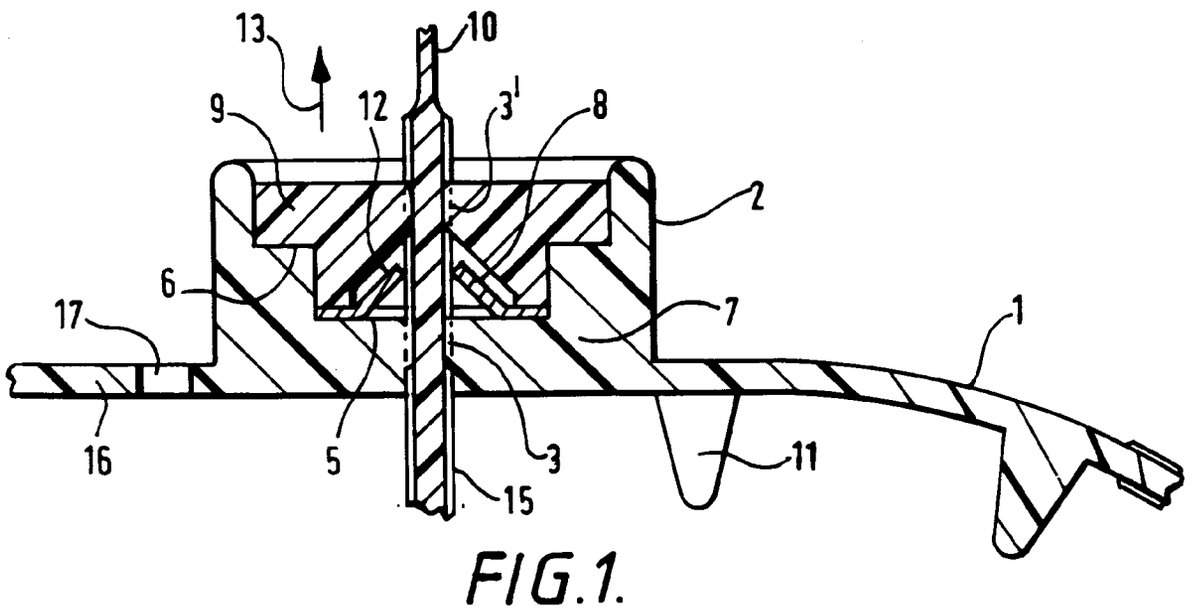

FIG.1.

EP 0 642 110 A1

This invention relates to a security seal, and more particularly to a tamper evident security seal suitable for tying the neck of a bag or the like.

Some examples of tamper evident security seals for tying bags are known. They generally comprise a strap, usually of plastics material, with a housing at one end. The housing includes a non-return passage into which the free end of the strap can be slidingly inserted, but not slidingly withdrawn therefrom. The strap can thus form a loop, which can be tightened around the neck of a bag. Such security seals are used for tying the necks of bags containing valuable items, in such a way that any unauthorised interference with the neck of the bag during transit of the bag is immediately evident. The strap is thus tightened around the neck of the bag before transit. After transit, the security seal is checked to make sure there has been no interference, and it is then cut or broken by authorised personnel.

In known examples of such security seals, the strap is of plastics material and circular in cross section. The passage in the housing is correspondingly circular, and incorporates between its ends a metal spring grip comprising teeth, usually four equally spaced around the circle, which project obliquely into the passage. As the free end of the strap is inserted into and passed through the passage, these teeth are deflected in the direction of insertion, so that the strap can be inserted in the passage to any desired extent, thus enabling the strap to be tightened around the neck of the bag. However, if an attempt is made to withdraw the strap from the passage, the teeth dig in to the plastics material of the strap and resist such withdrawal.

In another example, the strap comprises a succession of portions of varying diameter, the diameter of each portion being least where closest to the free end of the strap, and increasing gradually towards the end of the portion, where there is a sudden decrease in diameter, forming a flat circumferential shoulder, before the beginning of the next successive portion. During insertion of the strap into the passage, the teeth are deflected by the increasing diameter of each portion, but on attempted withdrawal, the teeth will abut against the flat shoulder portion and thus resist such withdrawal.

A disadvantage of the above known seals is that they are susceptible to unauthorised interference. By gradually twisting and pulling on the strap, it is possible to pull the strap in the direction of withdrawal past the teeth. This unauthorised interference can be assisted by inserting a pointed instrument into the passage and deflecting the teeth out of engagement with the strap. After such interference, the same strap can then be use to reseal the bag, and there may only be very slight evidence of the unauthorised interference, which can easily be overlooked by an inspector.

The present invention solves the problem of providing an improved security seal which does not suffer from the above disadvantages.

According to the invention, there is provided a tamper evident security seal suitable for tying the neck of a bag or the like, comprising a strap having a free end and a housing at its opposite end, the housing having a passage therethrough into one end of which the free end of the strap can be slidingly inserted and passed out through the other end of the passage so that the strap forms a loop, and teeth projecting obliquely into the passage between its ends so as to engage with the strap inside the passage, the teeth being made of material which is hard relative to the material of the strap, whereby the teeth permit sliding insertion of the strap into the passage but resist sliding withdrawal therefrom, characterised in that the end surfaces of the teeth in engagement with the strap form cutting edges, so that attempted forced withdrawal of the strap from the passage will cause the teeth to cut the strap.

Preferably the strap is made of plastics material and the teeth are made of metal.

Preferably the strap is a flat strap, having a width several times greater than its thickness. Preferably the teeth form two pairs of opposed, chamfered cutting edges, each engaging with a flat side of the strap.

Reference is now made to the accompanying drawings, in which:

Figure 1 is a partial cross section showing the strap engaged in the housing of a security seal, according to an embodiment of the invention;

Figure 2 is a view corresponding to Figure 1, showing the result of an attempted forced withdrawal of the strap from the housing; and

Figure 3 is a transverse cross section of the strap.

Figure 4 is a view of a metal spring grip which forms two pairs of opposed chamfered cutting edges; and

Figure 5 is a perspective view of the end of the strap including the housing.

In the embodiment shown in the drawings, the strap and housing are integrally moulded from a plastics material, such as polypropylene. The strap 1 is of flat ribbon-like cross section, which is readily bendable, and the cross sections of Figures 1 and 2 are longitudinal relative to the strap, so that the narrow side edge of the strap is visible. The housing 2 is integrally moulded at one end of the strap and comprises side walls and a central passage 3 shaped to accommodate the strap 1. At the outlet of the passage 3 the housing defines an internal flat surface 5 and a stepped further flat surface 6.

A metal spring grip 7 rests on the flat surface 5 and four chamfered teeth 8, which form part of the spring grip, project so as to partly obscure the end of the passage 3. The end edges of the teeth 8 are shaped as cutting edges. In the construction of the seal,

a plastics plug part 9, which is shaped to fit into the cavity defined by the side walls and the flat surfaces 5 and 6 of the housing, is inserted into that cavity so as to secure the spring grip 7 against the flat surface 5. The plug part 9 is then ultrasonically welded to the surfaces 6 to complete construction of the seal. The plug part 9 has a passage 3' defined therein, which is of the same dimensions and in register with the passage 3.

In use of the security seal, the free end 10 of the strap 1, which may be of reduced thickness, is inserted into the opening of the passage 3 and out through the end of the passage 3'. The strap thus forms a loop which may be pulled tight around the neck of the bag. To assist in gripping the bag, one or more spikes 11 may be provided on the surface of the strap so as to project into the bag. As the strap 1 is pulled through the passage 3, 3' the teeth 8 of the metal spring grip 7 are deflected to the side, so that they project obliquely into a central cavity 12 defined by internal surfaces of the housing and plug part, and between the two portions 3 and 3' of the passage. The strap 1 can thus be pulled through the passage in the housing 2, in the direction of the arrow 13 to any desirable extent, thus enabling the loop formed by the strap to be tightened around the neck of the bag.

The thickness of the metal teeth 8 is suitably about 0.3 mm. The ends of the metal teeth 8 are chamfered and rest against the flat sides of the strap 1, as shown in Figure 1. If an attempt is made to withdraw the strap 1 from the housing 2 by pulling it in the reverse direction to the arrow 13, then the metal teeth 8 dig into the flat sides of the strap 1 and resist such withdrawal. If a greater effort is made at such withdrawal, by pulling as shown by the arrow 14 in Figure 2, then the teeth 8 will actually cut through the strap 1. As the strap was previously tightened around the neck of the bag, it will be impossible to insert the shorter length of strap following such cutting, through the passage in the housing. Furthermore, because of the longitudinal stress incurred by the strap during tightening, an attempt to glue together the cut ends of the strap would be unsuccessful.

Because the strap 1 is flat, it cannot be withdrawn from the engagement in the housing by the sort of twisting action which has been possible with previous such security seals. Furthermore, the flat nature of the strap makes it more flexible so it can be secured around the neck of the bag more tightly than a strap of circular cross section.

The strap 1 preferably has longitudinal ribs 15, suitably two on each side, which make it difficult to insert a blade or the like through the entrance of the passage 3, in an unauthorised attempt to release the teeth 8. Such interference is also made more difficult by the fact that there are two teeth 8 on each side of the strap.

The end of the strap which accommodates the housing is preferably widened to form a web 16. Part of this web provides a flat surface on which suitable security information can be provided, such as a serial number or bar code. The web may also incorporate a tear line which completely surrounds the housing. This thus provides for convenient quick release of the security seal by authorised personnel. Partial tearing along the tear line is shown in Figure 5. The web may also include an aperture 17 through which the loose free end of the strap may be inserted so it does not extend an excessive distance from the bag.

A transverse cross section of the strap is shown in Figure 3, indicating its flat nature and the longitudinal ribs 15.

Claims

1. A tamper evident security seal suitable for tying the neck of a bag or the like, comprising a strap (1) having a free end and a housing (2) at its opposite end, the housing having a passage (3) therethrough into one end of which the free end of the strap can be slidingly inserted and passed out through the other end of the passage so that the strap forms a loop, and teeth (8) projecting obliquely into the passage between its ends so as to engage with the strap inside the passage, the teeth being made of material which is hard relative to the material of the strap, whereby the teeth permit sliding insertion of the strap into the passage but resist sliding withdrawal therefrom, characterised in that the end surfaces of the teeth (8) in engagement with the strap (1) form cutting edges, so that attempted forced withdrawal of the strap from the passage will cause the teeth to cut the strap.

2. A security seal according to Claim 1, in which the strap (1) is made of plastics material and the teeth (8) are made of metal.

3. A security seal according to Claim 1 or 2, in which the strap (1) is a flat strap, having a width several times greater than its thickness.

4. A security seal according to Claim 5, in which the teeth (8) form at least one pair of opposed cutting edges, each engaging with a flat side of the strap (1).

5. A security seal according to Claim 4, in which the teeth form two pairs of opposed cutting edges.

6. A security seal according to any of Claims 3 to 5, in which the ends of the teeth are chamfered.

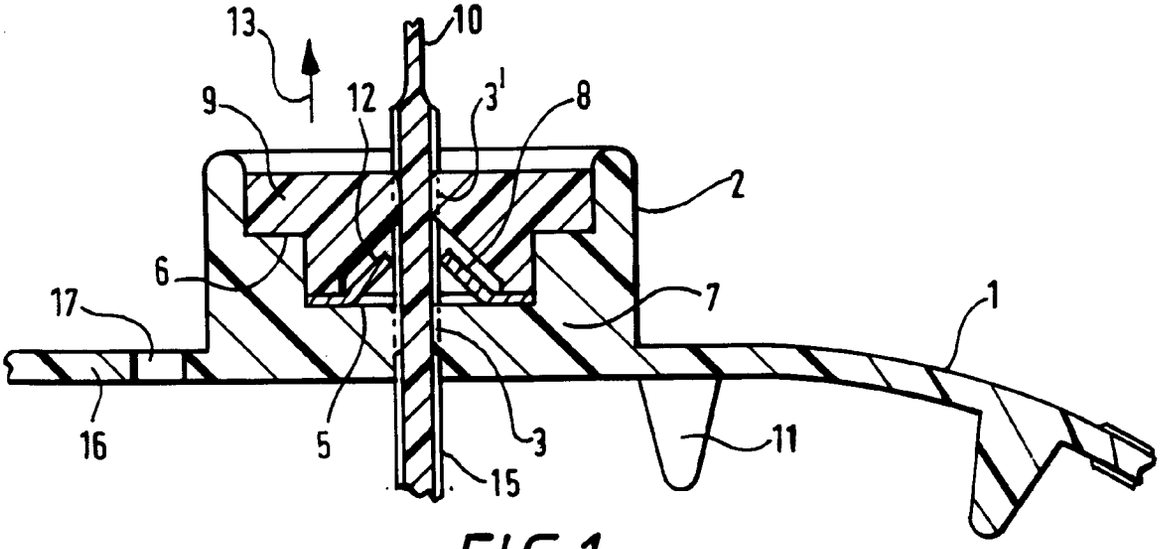

FIG.1.

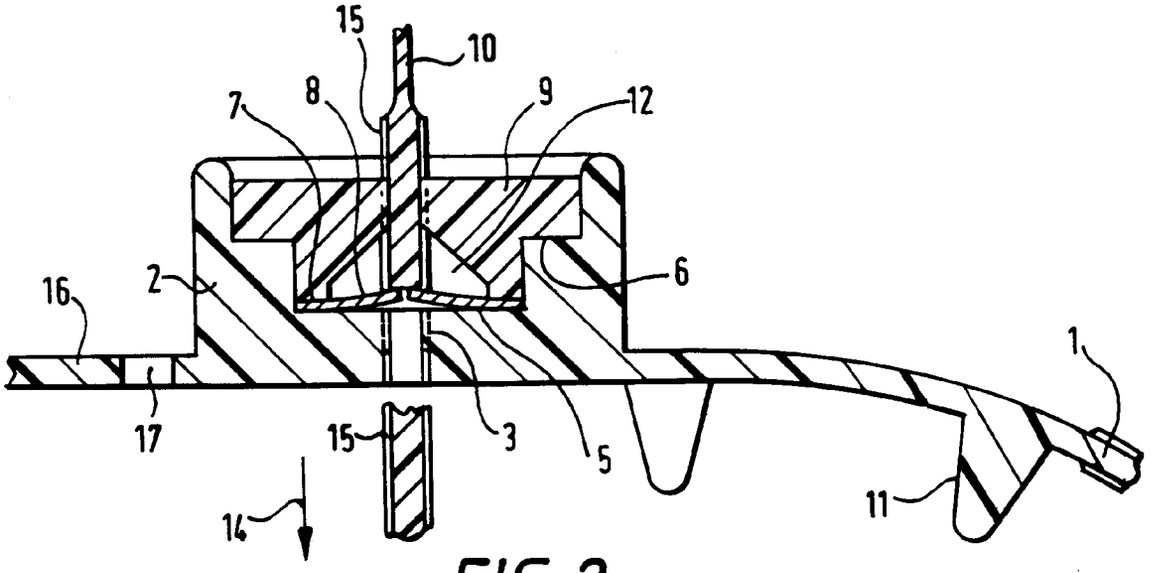

FIG.2.

FIG.3.

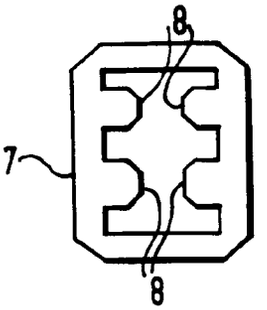

FIG.4.

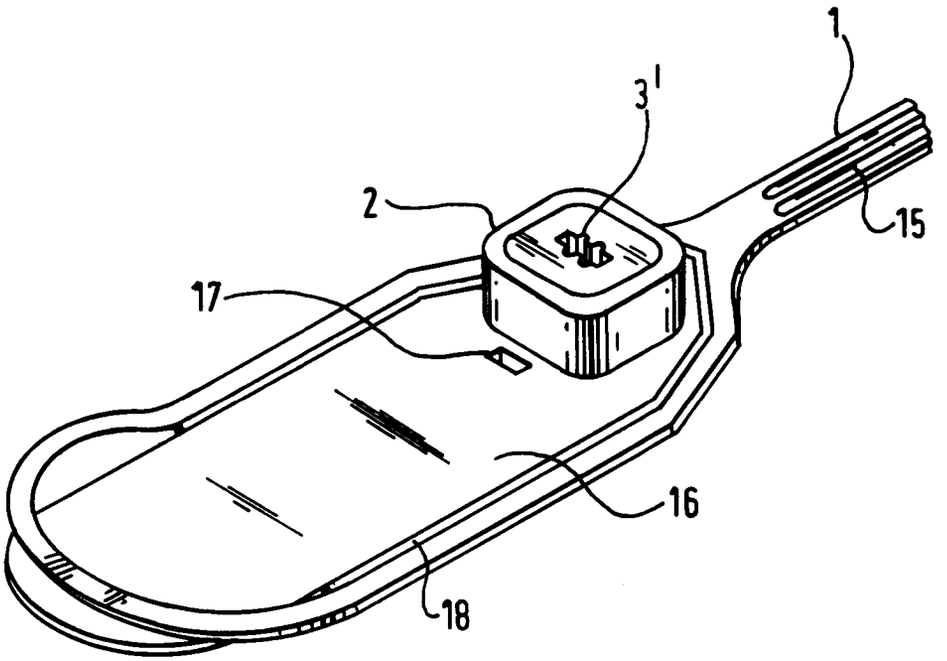

FIG.5.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 6573

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	GB-A-2 205 279 (ITW LTD.) * page 7, line 24 - page 8, line 17; figures 12-14 *	1-3	G09F3/03
A	US-A-5 183 301 (LUNDBERG) * column 2, line 15 - column 5, line 8; figures 1-6,8 *	1-3	
A	GB-A-2 106 840 (ITW LTD.) * page 2, lines 6-99; figures 1-7 *	1-3	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

G09F
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	8 November 1994	Taylor, P

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

EPO FORM 1503 03.82 (P04C01)