

## ALARM TAG

5       The invention relates to an alarm tag comprising two parts one of which is provided with a pin attached to said one part to be located on one side of a product with the pin extending through the product into locking engagement with the other part located on the opposite side of the  
10 product, said one part having means for activating an alarm device in said one part.

Existing alarm tags are of one or the other of two types. Either the alarm device is located in the alarm tag so that an alarm will be emitted from the alarm tag at  
15 theft of the protected product, or means in the alarm tag affect an external alarm device so that an alarm is emitted externally at theft. In both cases said one part has a completely passive element and comprises a head on the pin, most frequently of plastics, the only purpose of which is  
20 to maintain the alarm tag mechanically on the product. In both cases there are deficiencies regarding the security against theft to be afforded by the alarm tag. Thus, it is possible to remove the alarm tag from the protected product by cutting off the pin or by crushing the plastic head, and  
25 if this is done no alarm will be given unless either the pin is withdrawn from the alarm tag or the alarm tag is carried into or out of an external field. It is thus possible to remove the alarm tag and then walk out carrying the product from the area protected against theft without  
30 an alarm being given.

The purpose of the invention is to provide an alarm tag which improves the security against unauthorized removal from the product to be protected against theft by means of the alarm tag, and for this purpose the alarm tag  
35 of the kind referred to above has obtained according to the invention the characterizing features of claim 1.

In order to explain the invention in more detail reference is made to the accompanying drawing which discloses an illustrative embodiment and wherein

5 FIG. 1 is a side view of an alarm tag attached to a product which is shown fragmentarily in cross section, and

FIG. 2 is an enlarged cross sectional view of that part of the alarm tag which comprises a pin and a head.

10 In FIG. 1 there is disclosed an alarm tag which comprises a first part 10 containing means for initiating alarm from an alarm device which either is built into this part or consists of an external alarm device. The alarm is initiated when the alarm tag is carried out from a defined  
15 area in a department store or a shop due to the fact that the alarm tag then, at the exit from said area, will leave of an electromagnetic or electrostatic field maintained in said area, or is carried through such a field maintained between bows located one at each side of the exit passage.  
20 This part of the alarm tag can be of any existing known construction. Part 10 is applied to one side of a product 11. The alarm tag also comprises a second part 12 consisting of a pin 13 with a head 14 said head being applied to the opposite side of product 11 with the pin  
25 extending through the product and being attached to part 10. The attachment is such that the parts cannot be moved apart for removal of the alarm tag from the product unless the attachment is operated magnetically or mechanically in a special device at the site where the product is to be  
30 paid, according to a well-known technique applied in connection with alarm tags.

The invention is based on the knowledge that each attempt to move the two parts of the alarm tag apart or to cut off the pin by means of a cutter or the like which is  
35 inserted between the parts causes deforming forces on the

parts. This is utilized according to the invention in order to emit an alarm from the alarm tag when such deforming forces act on the alarm tag. Instead of being constructed in a known manner as a plastic head the only purpose of which is to maintain in co-operation with part 10 and pin 13 the alarm tag on the product, head 10 contains according to the invention an auxiliary alarm device in addition to the alarm device provided in part 10 or externally, said auxiliary alarm device being constructed to be activated as soon as deforming forces occur in part 12.

Part 12 is shown in detail in FIG. 2 and as can be seen head 14 comprises a bottom plate 15 which has for example circular shape. Said plate preferably is made of plastics of such kind that the plate is impact resistant and elastically deformable and also can be fused. A suitable material is for example polycarbonate. The plate has a downwardly extending peripheral rim 16 which stiffens the plate at the periphery, and a central bulge 17 in which the pin is attached at a head 18 formed on the pin. A cylindrical cover 19 is fused to plate 15 and includes a circuit board 20 with a battery 21 and an electronic circuit 22 located on said board. Contact springs 23 and 24 maintain electric connection between the electronic circuit and the battery, respectively, and a sound membrane 25. This electronic alarm device can be constructed according to principles which are well known in connection with miniaturized electronic alarm devices and therefore will not be described in further detail.

A bistable spring washer 26 of metal is located in the space defined between circuit board 20 and plate 15, and is attached at a central opening therein to the bulge 17 by the edge portion around the opening being received in a circular circumferential groove 24 in bulge 17. The spring washer functions as a contact element for switching the electronic alarm circuit on and off and normally is in

one stable position shown by solid lines, in which the spring washer is arched downwards and engages at the periphery thereof the upper surface of plate 15. When the spring washer is in this position the electronic circuit is de-energized and the alarm device accordingly is passive. Should plate 15 be deformed as can happen by the pin 13 being exposed to axial tension or by the pin being tilted this will cause the spring washer to snap to the other stable position thereof which is shown by dot and dash lines in FIG. 2. In this position the spring washer is arched upwards in order to engage at the periphery thereof the lower side of the circuit board 20 which has contact surfaces 28 for closing the electronic circuit when the spring washer engages said contact surfaces. Then, the alarm device will be activated the sound membrane 25 being induced to oscillate and to emit sound at a suitable frequency. In the cover 10 slots 29 are provided to "let out" the sound. Inside the cover there may be provided a resonance chamber for amplification of the generated sound.

If the alarm device has been activated it can be shut off by the spring washer being brought to snap back to the position shown by solid lines, but such resetting should of course be possible only in a device provided especially for that purpose by actuation of the spring washer.

The alarm device which in the illustrative embodiment is mounted in head 19 is an auxiliary alarm which will be activated as soon as plate 15 is deformed when somebody tries to remove the alarm tag from the protected product by manipulating the alarm tag. The alarm which sounds when somebody tries to carry away the product with the alarm tag attached thereto is emitted from part 10 or from an external alarm device and will be initiated in a known manner in co-operation with the external electromagnetic or electrostatic field. However, it is possible within the scope of the invention to have said latter alarm device

activated also via the bistable contact element and in that case the auxiliary alarm device can be dispensed with.

As would be easily understood the electronic alarm  
5 circuit can be constructed in many different ways within  
the scope of the inventive concept. It would also be  
understood that the contact element need not be a bistable  
element but can be constructed to trig an electronic  
circuit which keeps the alarm device activated after  
10 triggering. In the disclosed embodiment alarm will be given  
when an electric circuit is closed but it is also possible  
but less advantageous with regard to the power supply to  
have the spring washer keep an electric circuit closed when  
the alarm device is silent, alarm being given when said  
15 electric circuits is opened by the spring washer being  
switched.



## CLAIMS

1. Alarm tag comprising two parts one of which is provided with a pin (13) attached to said one part (12) to be located on one side of a product (11) with the pin  
5 extending through the product into locking engagement with the other part (10) located on the opposite side of the product, said one part having means for activating an alarm device in said one part, c h a r a c t e r i z e d in that  
10 said one part (10, 12) comprises a contact element (26) operatively related to said alarm device or a second alarm device (25), said contact element normally being in a first position in which the alarm device is silent but being constructed to be switched via the pin to a second position (26') in order to activate the alarm device at attempt to  
15 separate the two parts of the alarm tag.

2. Alarm tag as in claim 1, c h a r a c t e r i z e d in that the contact element (26) comprises a bistable element the two stable positions of which are said first and second positions.

20 3. Alarm tag as in claim 2, c h a r a c t e r i z e d in that the bistable element (26) comprises a bistable spring washer.

4. Alarm tag as in claim 1 or 2, c h a r a c t e r i z e d in that the contact element (26)  
25 is arranged to be switched to said second position (26) via the attachment of the pin (13).

5. Alarm tag as in any of claims 1 to 4, c h a r a c t e r i z e d in that the pin (13) and the contact element (26) are operatively connected with a  
30 resiliently deformable wall (15) in said one part.

6. Alarm tag as in claim 5, c h a r a c t e r i z e d in that the pin (13) is attached to a bulge (17) of the deformable wall (15).

7. Alarm tag as in claims 4 and 6,  
35 c h a r a c t e r i z e d in that the spring washer at the



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edge portion around an aperture therein is received in an annular groove (22) in the bulge (17) of the wall (15).

8. Alarm tag as in any of claims 1 to 7,  
c h a r a c t e r i z e d in that the contact element (26)  
5 is operatively related to an auxiliary alarm device (25)  
provided in said one part.

9. Alarm tag as in any of claims 5 to 8,  
c h a r a c t e r i z e d in that the resiliently  
deformable wall (15) forms an outside wall of a space  
10 receiving the alarm device.

10. Alarm tag as in claim 9,  
c h a r a c t e r i z e d in that the contact element (26)  
is provided between said wall (15) and a circuit board (20)  
inserted into said space, said board being provided with  
15 contacts (28) for the contact element.

11. Alarm tag as in claim 1,  
c h a r a c t e r i z e d in that the contact element is  
arranged to trig in said second position an electronic  
circuit for continuous activation of the alarm device.

## AMENDED CLAIMS

[received by the International Bureau on 14 September 1995(14.09.95) ;  
original claims 2 and 8 cancelled ; original claims 10 and 11 amended ;  
remaining claims unchanged ; all claims renumbered 1-9 (2 pages)]

1. Alarm tag comprising two parts one of which is provided with a pin (13) attached to said one part (12) to be located on one side of a product (11) with the pin  
5 extending through the product into locking engagement with the other part (10) located on the opposite side of the product, said one part having means for activating an alarm device in said one part, c h a r a c t e r i z e d in that  
10 said one part (10, 12) comprises a bistable contact element (26) operatively related to an electronic control circuit (20) for said alarm device or a second alarm device (25), said contact element normally being in one stable position in which the alarm device is silent but being constructed to be switched via the pin to the other stable position  
15 (26') in order to activate the alarm device at attempt to separate the two parts of the alarm tag.

2. Alarm tag as in claim 1, c h a r a c t e r i z e d in that the bistable element (26) comprises a bistable spring washer.

20 3. Alarm tag as in claim 1 or 2, c h a r a c t e r i z e d in that the contact element (26) is arranged to be switched to said second position (26) via the attachment of the pin (13).

4. Alarm tag as in any of claims 1 to 3, c h a r a c t e r i z e d in that the pin (13) and the contact element (26) are operatively connected with a resiliently deformable wall (15) in said one part.

25 5. Alarm tag as in claim 4, c h a r a c t e r i z e d in that the pin (13) is attached to a bulge (17) of the deformable wall (15).  
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6. Alarm tag as in claims 2 and 5, c h a r a c t e r i z e d in that the spring washer at the edge portion around an aperture therein is received in an annular groove (22) in the bulge (17) of the wall (15).



7. Alarm tag as in any of claims 4 to 6,  
c h a r a c t e r i z e d in that the resiliently  
deformable wall (15) forms an outside wall of a space  
receiving the alarm device.

5        8. Alarm tag as in claim 7,  
c h a r a c t e r i z e d in that the contact element (26)  
is provided between said wall (15) and a circuit board (20)  
inserted into said space, said electronic control circuit  
being included in said board and having contacts (28) for  
10 co-operation with the contact element (26).

9. Alarm tag as in any of claims 1 to 8,  
c h a r a c t e r i z e d in that said electronic control  
circuit is constructed to be triggered in said other position  
of the contact element (26) for continuous activation of  
15 the alarm device.

