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(71) Applicant:
BRITISH TELECOMMUNICATIONS public limited company
London EC1A 7AJ (GB)

(72) Inventors:
- **Rogers, Philip**
  Birmingham B36 9JA (GB)
- **Frith, Roderick Keith**
  Bangor Limited, Gwynedd LL57 4SP (GB)
- **Jones, John Gerwyn**
  Bangor, Gwynedd LL57 4SP (GB)
- **Bentley, Peter Richard**
  Bangor Limited, Gwynedd, LL57 4SP (GB)
- **Winslow, Bernard Paul**
  Bangor, Gwynedd LL57 4SP (GB)

(74) Representative:
Shelley, Mark Raymond et al
British Telecommunications plc
BT Group Legal Services,
Intellectual Property Department,
8th Floor, 120 Holborn
London EC1N 2TE (GB)

(54) Coin entry module

(57) A coin entry module has a plurality of chambers (13, 25) through which a coin must pass before reaching a coin exit (15) leading to a coin chute. Inserted coins change their angular direction at least once in passing from a coin entry slot to the second chamber. Any coin inserted must also change its angular direction prior to leaving the second chamber. Any object inserted in an attempt to block the passage of coins will be trapped by the first or second chamber thus minimising potential lost coinage by bona-fide customers and minimising or preventing coin recovery by thieves.

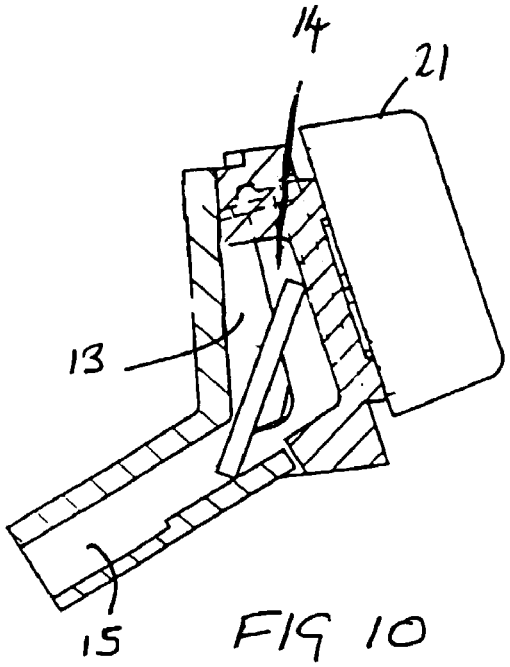

FIG 10

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Description

[0001] This invention relates to a coin entry module and more particularly but not exclusively to a coin entry module for use with a payphone.

[0002] One method, which is used by criminals to acquire cash inserted in coin handling mechanisms, for example, of coin operated telephones, is known as "blocking" or "stuffing". In one method the criminal inserts an object in to the coin mechanism so that subsequently inserted coins accumulate behind the block. At a later time the block is forced through the mechanism so that the accumulated coins drop in to the refund chute and can be collected.

[0003] Alternatively, where a block is inserted attempts may be made to "fish" coins back through the entry slot. In either case, the legitimate customer is deprived of the coins inserted without being provided with service and/or the coin operated payphone may be rendered inoperable to cash customers. The provider of the telephone service is also deprived of revenue, which should occur from legitimate usage of the payphone and may be faced with refunding "lost" coins to customers.

[0004] One type of coin entry mechanism which has been used in attempt to prevent blocking comprises a slider incorporating an indentation in to which a coin may be inserted against a back plate, the coin then being pushed along the back plate by the slide mechanism to enter an internal coin runway. While such coin entry mechanisms may reduce the opportunity for theft by blocking, they also increase the difficulty of inserting coins for less able people such as those with arthritic hands for example who may find a simple entry slot more user-friendly.

[0005] According to the present invention there is provided a coin entry module comprising a first coin chamber having an entry slot through which a coin may enter to the first chamber, an angled coin runway from the first chamber to a second chamber arranged such that an inserted coin changes angle between entering the first chamber and entering the second chamber, the second chamber having an exit runway arranged such that any inserted coin turns through a further angle prior to exiting the second chamber.

[0006] Preferably said second chamber is of a size suitable to allow only one coin of maximum acceptable diameter to be inserted whereby any inserted block prevents more than two coins to accumulate in the module prior to preventing the insertion of further coins.

[0007] The angle of the first chamber with respect to the second chamber may be such that once a coin is inserted to the module fishing of the coin back through the entry slot is impractical.

[0008] The first coin chamber may comprise a metallic moneybox detachable from the rear face whereby blocks and inserted coins may be removed by authorised persons having access to the rear of the coin entry module.

[0009] The entry slot may be shaped such that certain coins of a greater thickness must be raised above an entry lip such that the coin drops behind the faceplate by a comparatively greater distance from the insertion height than coins of lesser thickness.

[0010] According to a feature of the invention there is provided a money box attachment for attaching to a faceplate of a coin entry module, said money box attachment including a face plate having a coin entry slot and an aperture for inserted coins to exit to a coin entrance of an attached coin entry module, the angle of insertion and exit being such as to cause any such inserted coin to turn through at least one angle prior to entering the coin entry module.

[0011] In accordance with a further feature of the invention there is provided a coin operated payphone including a coinbox, which has a coin entry module in accordance with the invention.

[0012] A coin entry module in accordance with the invention will now be described by way of example only with reference to the accompanying drawings of which:

Figure 1 is a front view of a part of a known payphone;
Figure 2 is a view of a known type of coin entry module;
Figure 3 is a cross-section taken on the line III-III of Figure 2;
Figure 4 is a perspective view, from the front, of part of a coin entry module according to an embodiment of the invention;
Figure 5 is a perspective view, from the rear, of part of the coin entry module of Figure 4;
Figure 6 is a cross-section view taken along the line VI-VI of Figure 4;
Figure 7 is a front view of a coin entry module according to an embodiment of the invention;
Figure 8 is a cross-section view taken along the line VIII-VIII of Figure 7;
Figure 9 is a rear view of the coin entry module of Figure 7; and,
Figure 10 is a cross-section view taken along line X-X of Figure 7.

[0013] Referring to the drawings, Figure 1 shows a typical, known payphone kiosk installation viewed from the front, the installation including a case 1 having a lockable hinged front to enable engineering access, and to permit access to a coin holding facility (not shown). A telephone handset 2 and a receptacle 3, for holding the handset when not in use, are also provided. A keypad 4 enables users to make calls through automatic telephone networks, and a user instruction window 5 is provided 5, the window either carrying visible user instructions or, or being of the electronic kind capable of displaying messages transmitted from an exchange.

[0014] The front face of the casing 1 is provided with

a coin entry position 6, and with a refund tray 7, which may have a flap to retain coins rejected or refunded by an internal coin mechanism.

[0015] The coin entry point 6 normally has a coin entry module inserted from the inside of the case 1, the coin entry module being attached, in a non-removable manner except by access from the inside, to the case. The coin entry module has an exit leading to a coin chute (not shown in Figure 1) leading to a coin store which has exits either to the refund tray 7 or to the internal coinbox of the payphone unit.

[0016] Figures 2 and 3 show a known coin entry module suitable for fitting to the case 1 of the installation of Figure 1. The coin entry module includes a front face 10 provided with an side entry aperture 11 having a sloping rear face to enable a coin to be pushed behind a face plate 12, so that the coin enters a coin passage 13 behind a rib 14 on the front face. The coin, thus inserted, is guided towards a coin exit 15, which is connected to an internal coin chute (not shown). The coin exit 15 is inclined relative to the direction of the passage 13 such that the coin falls in the exit 15 once it has passed the rib 14. As shown in Figure 3, the end of the coin passage 13 is open and this may lead to the problems previously referred to whereby a coin inserted through the aperture 11 may have its passage inhibited by an object blocking the coin passage. If such an object is subsequently pushed through the open end, then coins inserted will pass through the coin exit 15 and down the internal coin chute to be refunded through a coin refund mechanism to the refund tray 7. Blocking of such a coin mechanism nearer to the refund passage or coin handling mechanism can lead to substantial coin build up. Thus substantial returns to criminals may accumulate.

[0017] Referring now to Figures 4 to 6, a coin entry attachment 20, which is adapted to fit over the faceplate 12 and aperture 11, is shown. The attachment 20 is constructed as a single piece casing and comprises a front face 21, a rear face 22, a base section 23 (shown towards the bottom of the drawings of Figures 4 and 5) and a top section 24 (shown towards the top of the drawings) with a hollow internal cavity 25 provided therebetween. A coin entry slot 26 is provided in the front face 21 to allow coins to be inserted into the cavity 25. The coin entry slot extends vertically between the base 23 and top 24 with the respective ends of the slot being spaced from these sections. The coin entry slot 26 is stepped part way along its length to provide two distinct regions 27 and 28 for receiving coins of different thickness. The wider region 27 is spaced further from the base 23 so that thicker coins, normally coins of higher value, are entered further towards the top of the slot. As shown in Figure 6, the direction of the coin entry slot 26 is angled with respect to the plane of the rear face 22 so that coins enter the cavity 25 in the specific direction of arrow A in the drawing. A pair of internally threaded bores 29 are provided in the rear face 22 for fixing the attachment to the face plate 12 of Figure 2. The bores 29 allow the attachment to be fixed to the face plate from the rear of the face plate so that removal of the attachment cannot be effected without gaining access to the inside of the case 1.

[0018] With reference now to Figures 7 to 10, the attachment 20 is fixed to the faceplate 12 of Figure 2 by means of suitable threaded fasteners 30 which extend through apertures in the faceplate. As shown in Figure 7, when the attachment is fixed to the faceplate the cavity 25 provides a preliminary coin chamber in the region between the coin entry slot 26 and the faceplate. The preliminary coin chamber is adapted to direct inserted coins towards the aperture 11, but limit the ability of other objects to be inserted to block the coin chamber 23 and the coin passage 13. In this respect the slot 26 and the aperture 11 are not angularly aligned.

[0019] When a coin is inserted in the slot 26 it falls under its weight onto the base 23 of the coin chamber 25. This causes the coin to gain momentum and lose its balance, thus tipping away from the slot as it enters the chamber 25. The preliminary coin chamber directs the inserted coin towards the side entry aperture 11. The coin turns through a first angle in the preliminary chamber to align itself with the aperture 11. The angle the coin turns through is determined by the relative angular directions of the slot 26 and the aperture 11. As shown in Figures 9 and 10, the coin then enters a further chamber defined by the passage 13. The angular direction of the coin changes further between entering the aperture 11 and the passage 13 as it passes along the inclined rear face of the aperture. The coin rolls in the passage 13 until it passes the rib 14 where it falls forward (to the right of the drawing in Figure 10) and aligns with and ultimately falls through the coin exit 15 to enter the attached coin chute (not shown). When the coin falls forward it essentially stops rolling and then slides on one of its faces through the coin exit 15.

[0020] The arrangement of the coin entry slot 26, aperture 11, rib 14, and coin chambers 13 and 25 makes removal of any inserted coin by way of the slot 26 extremely difficult.

[0021] Further, any object inserted in an attempt to cause a build up of coins within the mechanism will be trapped in the second chamber formed by the passage 13, unless it is first trapped in the chamber 25. Since an inserted object can only be removed by engineering action the possibility of substantial returns by blocking and stuffing of the mechanism is seriously limited. This ensures that a minimum number of customers are inconvenienced by failure of the box or phone to operate due to criminal activity.

[0022] As mentioned previously, thicker coins, normally those of higher value, must be inserted towards the top of the attachment 20. This means that higher value coins will fall further below the slot level and would require lifting a considerable height even it was possible to re-align an inserted coin with the slot 26.

[0023] Other features (not shown) may be introduced in the chambers 13, 25 or in the attachment 20 to inhibit insertion of blocks and to further restrict any reverse movement of inserted coins towards the slot 26.

[0024] While as hereinbefore described, the slot in the attachment 20 is shown as in the vertical face, it will be appreciated that other orientations of the forward preliminary chamber and slot arrangement may be employed without detracting from the defensive arrangement requiring the multiple angular travel of coins between the coin entry slot and an exit from the coin entry module to the coin handling mechanism.

[0025] It will also be recognised that while herein, an attachment for an existing coin entry module to convert such a module from a single chamber to a dual chamber device is disclosed, it may be preferable for the attachment to be cast in one piece with the entry module. Alternate fixing methods may be used without detracting from the invention. It is also noted that while the attachment is shown as being potentially forward of the faceplate of a payphone cabinet, the entire unit could be suitably mounted behind the faceplate with a modification to the faceplate such that only the coin slot and its immediate surround are accessible from the outside of the payphone housing.

Claims

1. A coin entry module comprising a first coin chamber having an entry slot through which a coin may enter to the first chamber, a coin runway from the first chamber to a second chamber arranged such that an inserted coin turns through a first angle between entering the first chamber and entering the second chamber, the second chamber having an exit runway arranged such that any inserted coin turns through a further angle at the exit of the second chamber.

2. A coin entry module as claimed in claim 1, wherein the second chamber is adapted to allow only one coin of a maximum acceptable diameter to be inserted whereby an inserted block prevents insertion of further coins.

3. A coin entry module as claimed in claim 1 or claim 2, wherein the angular orientation of the first chamber with respect to the second chamber is such that once a coin is inserted in the module fishing of the coin from the second chamber through the entry slot is substantially prevented.

4. A coin entry module as claimed in any preceding claim wherein the first coin chamber comprises a moneybox detachable from a rear face of the coin entry module so that blocks and inserted coins may be removed by authorised persons having access to the rear of the coin entry module.

5. A coin entry module as claimed in any preceding claim, including a coin entry slot shaped such that coins of a greater thickness are inserted above an entry lip in the slot such that thicker coins drop into said first chamber by a comparatively greater distance than coins of a lesser thickness.

6. A coin box attachment for attachment to a coin entry module, said attachment comprising a coin entry slot and an exit aperture for inserted coins to exit to a coin entry of the coin entry module to be attached, the angle of the slot being such that coins inserted through the slot turn through an angle before entering the coin entry of the coin entry module.

7. A coin operated payphone comprising a coin entry module in accordance with any one of claims 1 to 5.

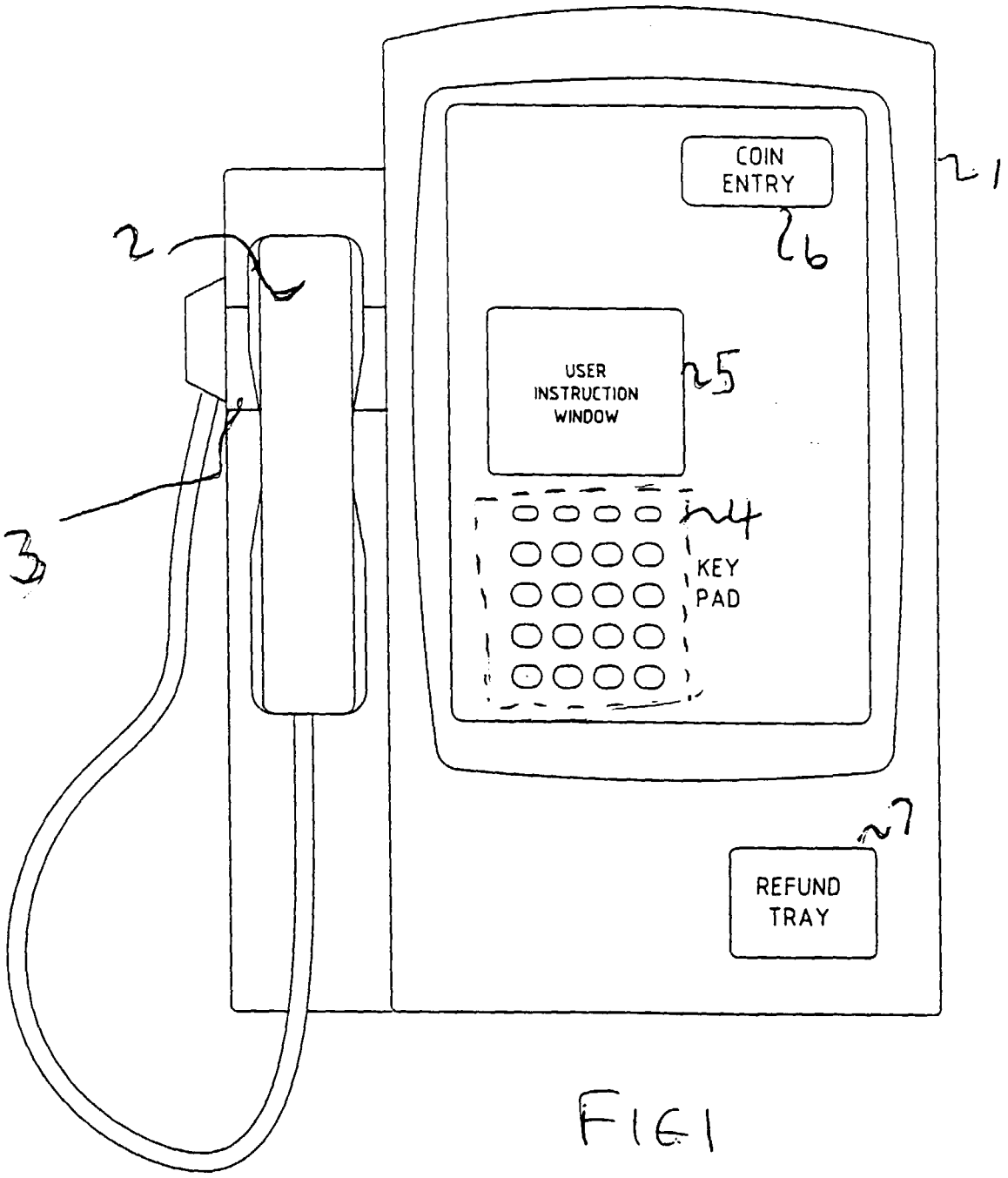
COIN ENTRY
21
2
26
USER INSTRUCTION WINDOW
25
3
24
KEY PAD
27
REFUND TRAY

FIG 1

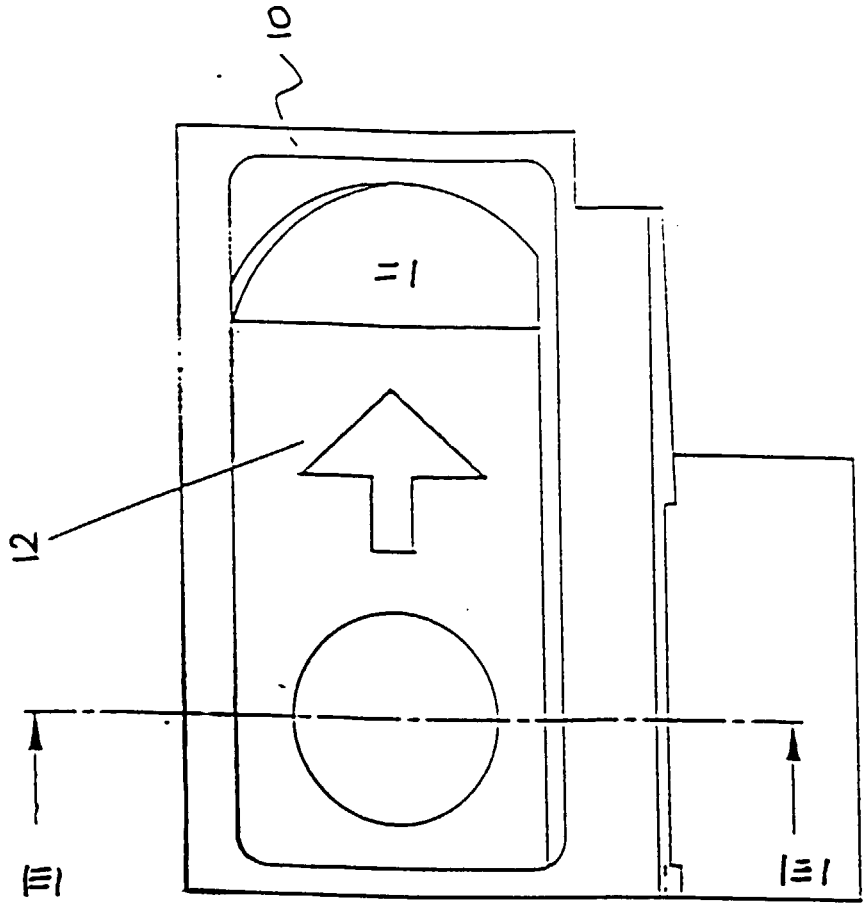

Fig. 2

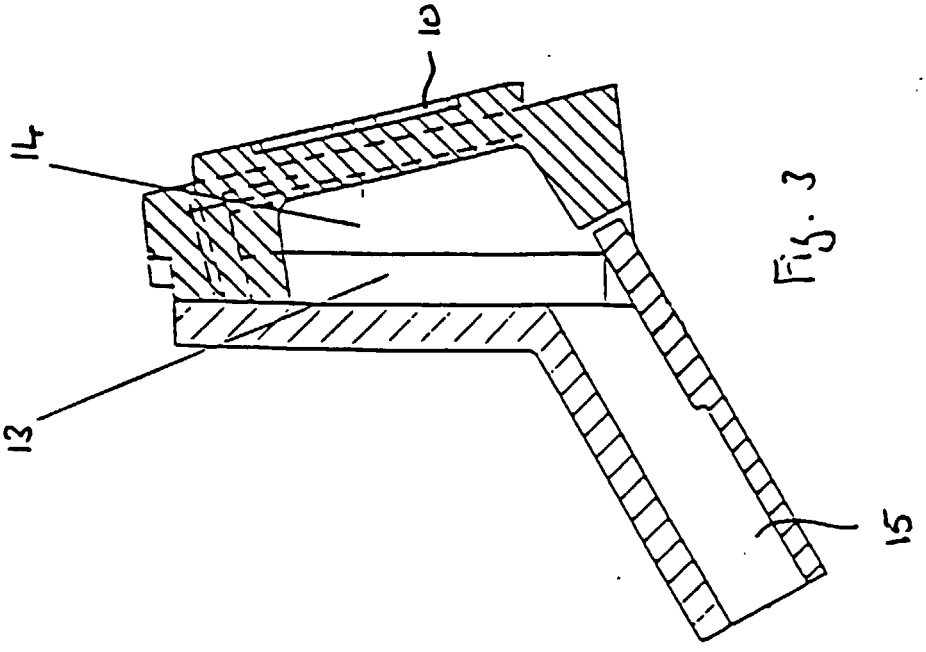

Fig. 3

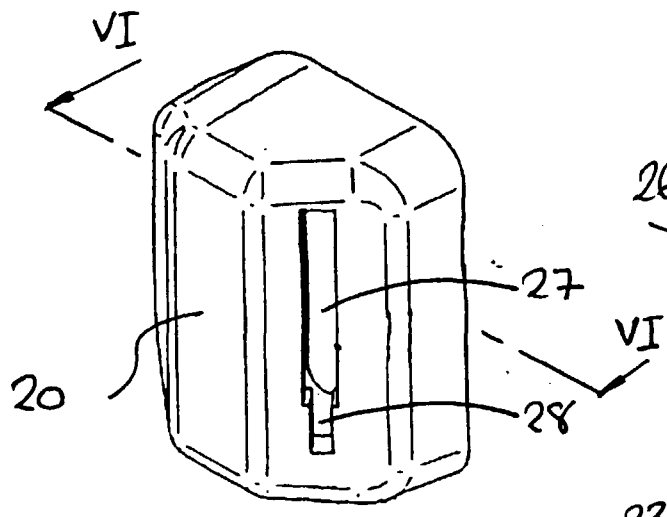

Fig 4

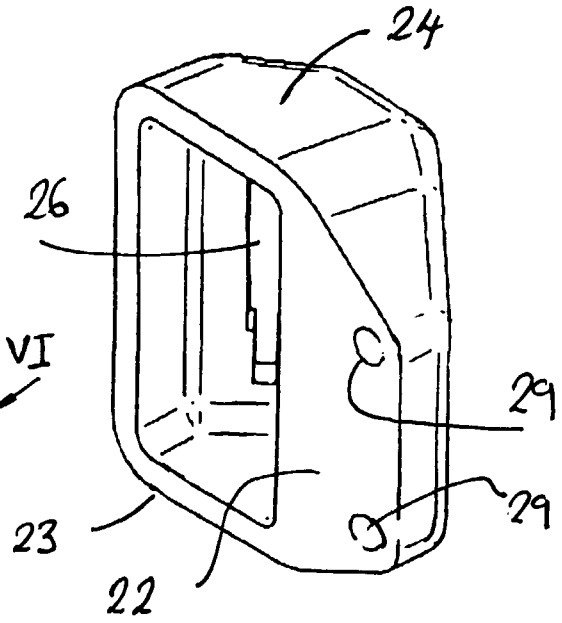

Fig 5

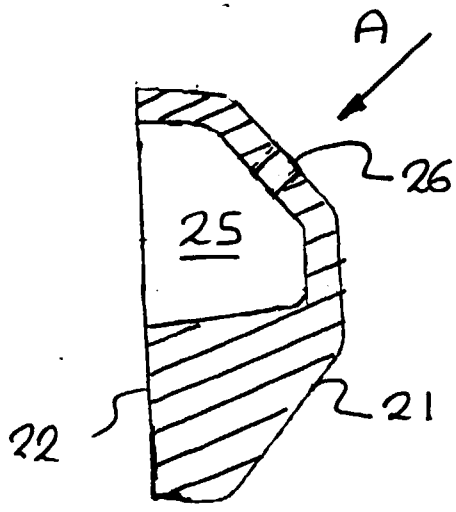

Fig 6

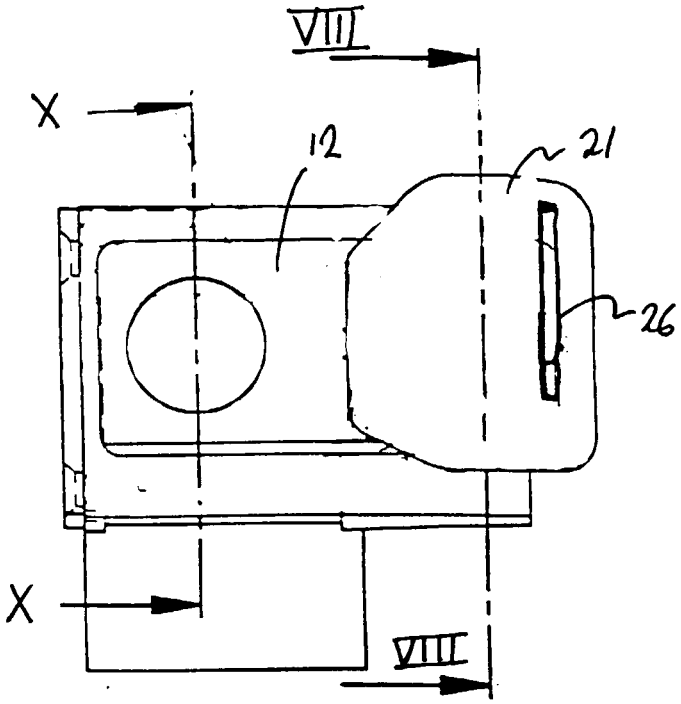

FIG 7

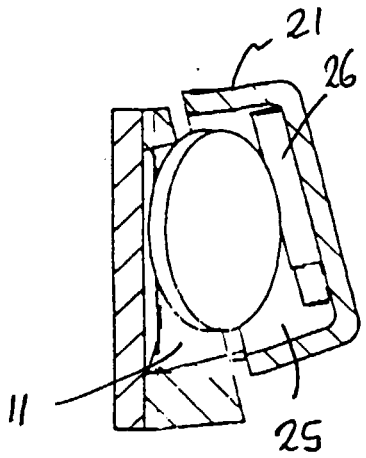

FIG 8

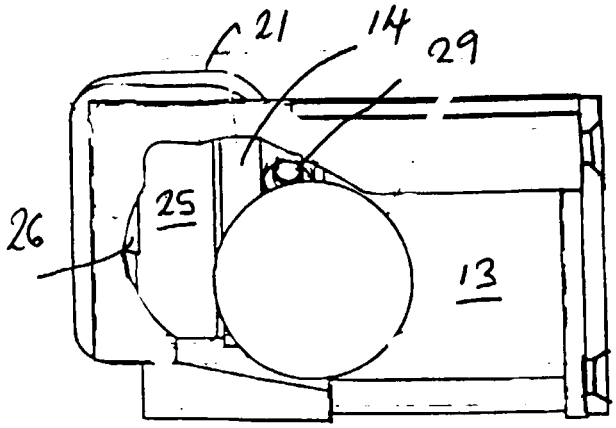

FIG 9

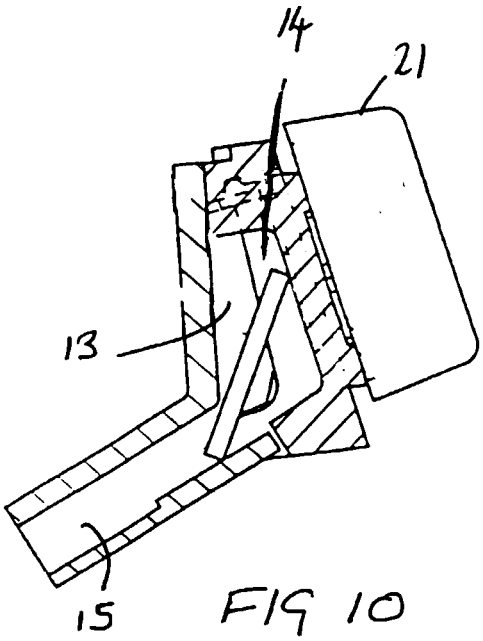

FIG 10

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 20 2240

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.7)
X	EP 0 173 112 A (AUTELCA) 5 March 1986 (1986-03-05) * abstract; figures *	1,3,7	G07F1/02
X	DE 35 13 767 A (STANDARD ELEKTRIK LORENZ) 23 October 1986 (1986-10-23)	6,7	
A	* abstract; figures *	1-4	
A	DE 34 09 583 A (SIEMENS) 19 September 1985 (1985-09-19) * abstract; figures *	1-3,6,7	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G07F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 October 1999	Neville, D

CATEGORY OF CITED DOCUMENTS

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12-10-1999

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