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

(11) Publication number: **0 610 738 A1**

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **94101235.3**

(51) Int. Cl.[5]: **E05B 19/00**

(22) Date of filing: **28.01.94**

(30) Priority: **11.02.93 IT VA930004**

(43) Date of publication of application:
17.08.94 Bulletin 94/33

(84) Designated Contracting States:
AT BE CH DK ES FR GB GR IE LI PT SE

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(54) **Ignition key including a transmitter.**

(57) The unit is formed by working heads (2) of all blank keys of different types of cars so as to confer all heads the same shape and size in order to lodge all the heads (2) worked in this way and the remote control circuit (10) within a case (3, 30) that is always the same.

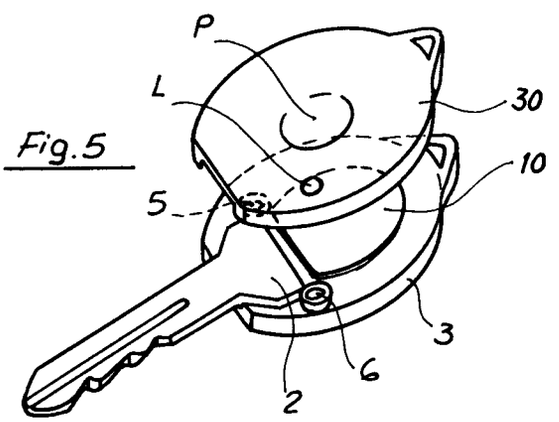

Fig.5

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The present invention concerns a unit with an alarm remote control and starter key for automobiles.

In the field of electronic alarm or anti-theft devices for cars first one moved from a separate remote control to a key-ring remote control, and from the latter to a remote control incorporated into a case that contains both the alarm remote control's electronic circuit and the head of the key, all thanks to the increasingly small dimensions of said circuit afforded by progress in electronics. The following description will identify:

- "alarm" as an electronic alarm and/or anti-theft device for automobiles;
- "key, as a key with which to open doors and start the car engine;
- "key-head" as a grip consisting of a case containing said electronic circuit, the head of the key associated to the same case and the blade thereof extends out of the case and at least one button to activate said electronic circuit (obviously, then, the grip is none other than unit subject of the present invention).

The convenience for a driver of possessing a single object with which to control doors, start-up and for controlling one's car alarm, is evident. But, if one considers that each automobile manufacturer produces a number of types of chain-assembled cars (apart from custom-built ones) and that for each of these types at least one corresponding key is produced, one may understand how costly it would be for an alarm manufacturer to produce and manage such a large number of remote control-key units required to satisfy so many different requests. In the best of cases some automobile manufacturers produce only one type or a few types of keys for their types of cars. But this does not greatly change the problem of the current state of affairs that is basically solved by producing a large number of molds for the two shells of said case.

The production of one of said units or grips involves the availability and association of the following elements:

- an electronic circuit for said remote control,
- a blank key;
- a case in which to enclose said circuit and the head of said blank key.

By blank key we intend a key in which the blade still has no teeth to operate on doors and starter of a car and the head shaped so as to fit into one of said cases or to act as a grip itself.

Therefore a producer of alarms who intends placing a key-head on the market for a given car, must design the molds for the two shells of the case that must be suited to the head of a given key and the electronic circuit must be suited to being fitted within the same case; hence, he will have to direct the final users to the car dealer that can supply the suitable blank key; owing to the fact that there are many shapes of blank keys, and so of key heads, the alarm producer will have to design and construct pairs of molds for each brand of car or even for each type of key. One clearly understands that these conditions discourage producers from marketing a key-head for each type of car and, rather, pushes them to providing key heads only for the most popular types of car on the market.

The present invention obviates to the inconveniences of the state of the art and, as characterized in the claims, solves the problem of having to place grips for any kind of car without having to design and produce a great quantity of different molds for cases.

The solving idea of the above problem lies in producing a grip by:

- 1) procuring from one or more manufacturers the desired quantity of each type of blank keys suited to the various types of cars,
- 2) working the heads of each blank key obtained by means of step 1) in order to obtain heads all with the same shape and size suited to conferring each head at least sufficient torsion resistance for operations;
- 3) obtain two shells to form one of said cases in which a space in which to fit and hold said worked head and a space to receive the remote control circuit are defined.
- 4) enclose, between pairs of corresponding shells a remote control circuit and a worked key head in order to obtain the desired quantity of key-heads for each type of car desired.

One advantage of the invention lies in the fact that it affords the design and production of a single pair of molds to provide always the same case that will form the desired quantity of different types of key-heads, different for what concerns the key blade, but identical for what concerns the cases. Another advantage lies in being able to obtain a grip with a standard or special alarm circuit, as long as it can be contained within the space appropriately designed in the case.

Obviously, said case, according to the prior art, will include devices for the fastening of the two shells and for the lodging of said circuit and at least one button for the activation of the remote control circuit. One may understand that when we state that two molds are required (for the two shells) we intend that the two shells may be formed by a mold (punch) and a counter-mold (matrix), each bearing two prints, one for the upper shell and one for the lower shell, in order to obtain a fester production.

Moreover, because the thicknesses of the keys marketed vary between 2 and 3.55 mm., in order to obtain a standard head we have chosen a thick-

ness of 2 mm.

The above defined solution excepts the case of those special keys formed by milling and/or lathing of cylindrical or polygon steel bars. These bars have a diameter or diagonal close to 3.5 mm, instead of the 2.5 mm. of standard keys, for mass produced cars, and for this reason it is impossible to obtain a flat and laterally extended head such that it may be safely fastened within the grip previously described. So, the heads of these keys may be reduced to a flat shank, generally 2.5 mm. thick, that is then co-molded with plastic in order to produce a mixed steel-plastic shape with a similar perimeter to that given to the heads of standard keys, but with a greater thickness, generally 3.5 mm., so as to obtain sufficient resistance in the plastic section. It will be enough, for these special keys, to provide for a second pair of molds that will form a case that is thicker than the previous one, so as to contain the thicker head. With this procedure one has the advantage of covering all the automobile market requirements, that is of supplying key-heads for custom made cars.

The invention is described below with reference to the drawings attached that represent a preferred embodiment and in which

Fig. 1 is a schematic part view of a blank key,

Fig. 2 is a schematic part view of a worked blank key,

Fig. 3 is a plan view of a detail,

Fig. 4 is a schematic perspective of the shell,

Fig. 5 is a blow-out view of a key-head,

Fig. 6 is a schematic view of a pair of shells and,

Fig. 7 is a cross section of a head.

Fig. 1 shows part of blade 1 and head 2 of a blank key that is worked in stage 2) of the procedure patented; in a) the lines outlined l_1 and l_2 show the cutting lines required to reduce the head of the blank key to the perimeter required: an upper diagonal portion and two longitudinal portions are removed, one at each lateral edge (outlined parts); in b) lines l_3 show the milling lines to reduce the head of the blank key to the thickness desired (outlined parts). IA identifies the part of blade usually called "neck".

Fig. 2 shows two worked keys for different cars and hence with blade 1 differing, but with heads 2 being identical.

Fig. 3 shows in detail the characteristics of a preferred embodiment of head 2 obtained during stage 2) of the procedure: the thickness of blade 1 is 2.5 mm., while the thickness of head 2 is 2 mm.; the shape and perimeter dimensions of head 2 are shown in the figure.

Fig. 4 shows the lower shell 3 of a case obtained during stage 3) of the procedure; this shell comprises three cylindrical spurs 4, 5, and 6, where 4 has a top cavity and 5 and 6, that have a central hole, correspond to as many spurs in the corresponding upper shell; the latter spurs have a threaded hole so that the two shells may be fastened together by means of screws in said holes. In the cavity of cylindrical spur 4 a corresponding spur in the upper shell will fit. A diaphragm 7, that extends from one wall of the shell to the other, serves the purpose of stopping the head of the key; facing diaphragm 7 the shell offers an aperture 8 that is 14.3 mm. wide so suited to the passage of the wider blade key neck; diametrically opposite said aperture 8 there is a loop 9 that, together with the corresponding loop in the upper shell will serve for the fastening of a key ring strap.

Fig. 5 schematically shows the lower shell 3 in which the remote control circuit 10 and the head 2 of the key worked according to the invention. 5 and 6 again identify the above said cylindrical spurs, and P identifies a button and L identifies a LED. The upper shell 30 is ready to be forced onto the lower shell to produce the finished key-head.

Fig. 6 shows in detail the apertures 8 of the two shells 3 and 30; while the width is always 14.3 mm., their height H is 1 mm for shells suited to all standard keys, and 1.75 mm. for shells suited to non standard keys, for custom made cars.

Fig. 7 shows the head of a key, formed from a non standard circular section key 11 with diameter 7 mm.; the upper part of the key is worked to obtain a rectangular section 12 with thickness 2 mm.; this section is co-molded with plastic 13 to form a head that has the same perimeter shape as shown in Fig. 1 but a thickness S = 3.5 mm.

Claims

1. A unit with an alarm remote control and a starter key for automobiles comprising a case containing a circuit for said remote control, at least one button P and a LED L, respectively to activate said circuit and show that the battery for said circuit is charged or not, and incorporating the head of said key characterized in that it is obtained by:

1) procuring a desired quantity of each type of blank keys (1) suited to various types of cars chosen;

2) working heads (2) of each blank key procured in stage 1) to form all heads (2) in identical shape and size, said shape and size being at least sufficient to provide the required resistance to torsion applied in operations;

3) obtain a series of two shells (3, 30) to form a quantity of said cases in each of which a space in which to fit and hold said worked head (2) and a space to receive the

remote control circuit (10) are defined, said series being a series of two shells always the same.
4) enclose, between pairs of corresponding shells (3, 30) said remote control circuit (10) and a worked key head (2) in order to obtain the desired quantity of said units for each type of car.

2. Unit according to Claim 1 characterized in that each of the worked heads (2) has a width of about 20 mm., a height of about 7 mm. and thickness about 2 mm.

3. Unit according to Claim 1 characterized in that in stage 3) a series of said two shells (3, 30) are formed different in shape and size.

4. Unit according to Claim 1 characterized in that one or both of said shells (3, 30) comprise means (7) for fastening said head (2).

5. Unit according to Claim 1 characterized in that said stage 2) comprises operations for working each head of the blank keys so as to reduce them to an extension (12) about 2 mm. thick and co-molding said extension with plastic (13) in order to form a head having a width and thickness suited at least to conferring the co-molded head with the required resistance to torsion during operations and to lodging said co-molded head in said case (3, 30).

6. Unit according to Claim 5 characterized in that said extension (12) has width equal to blade (11) of a special key and the plastic part co-molded has width (L) about 20 mm. and thickness (S) about 3.5 mm.

Fig.1

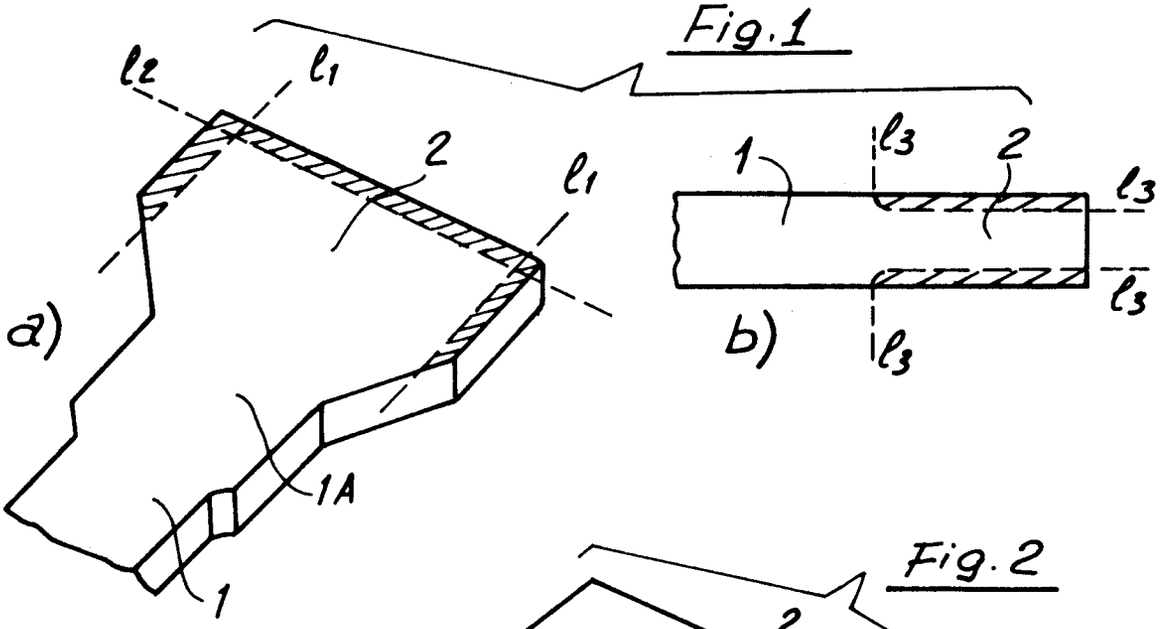
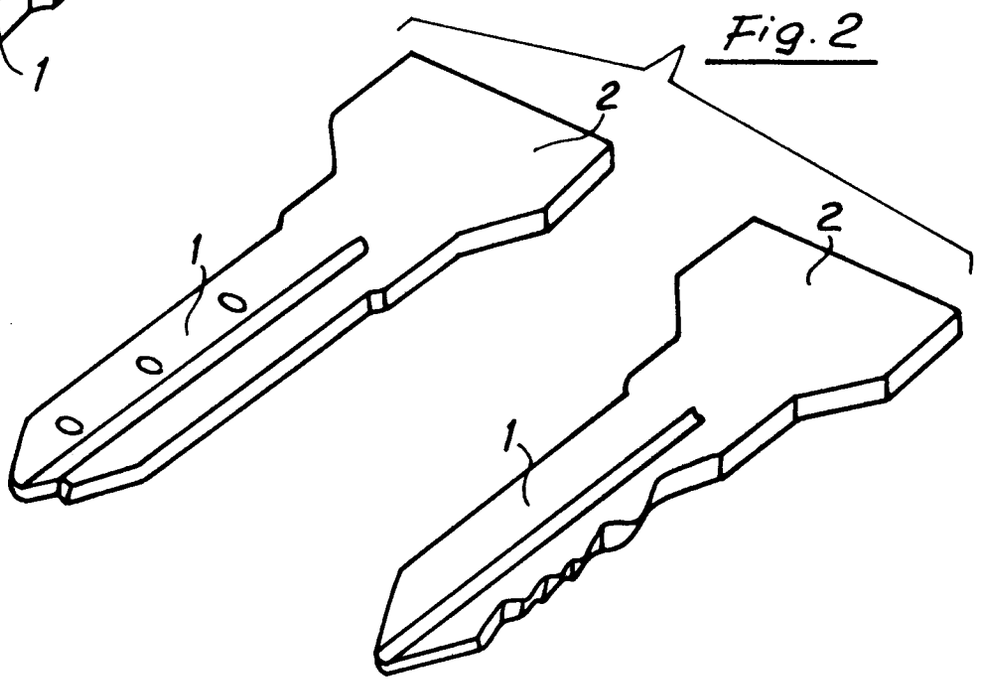


Fig.2



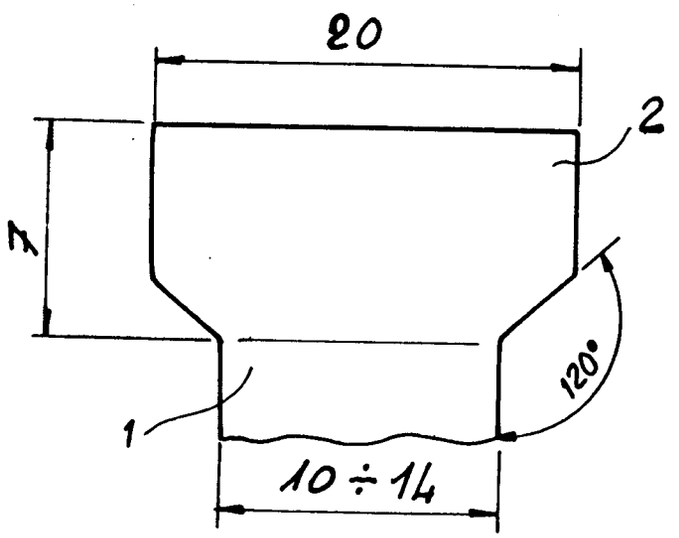


Fig.3

Fig.4

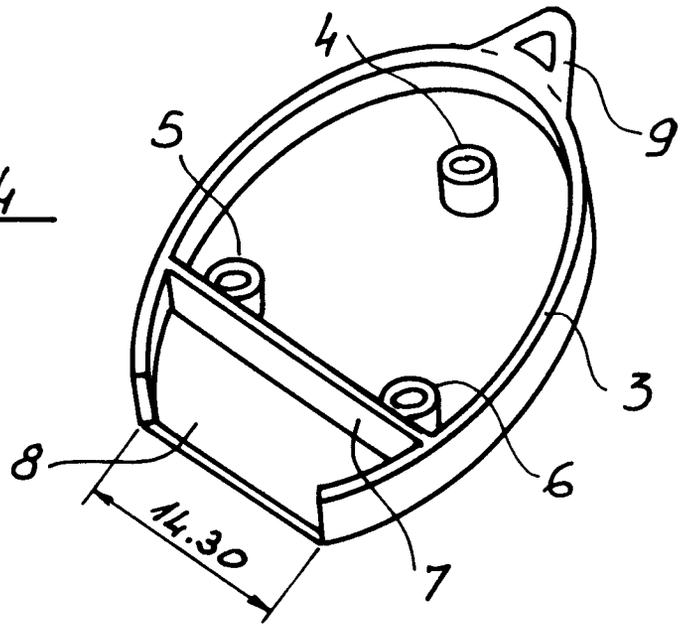


Fig.5

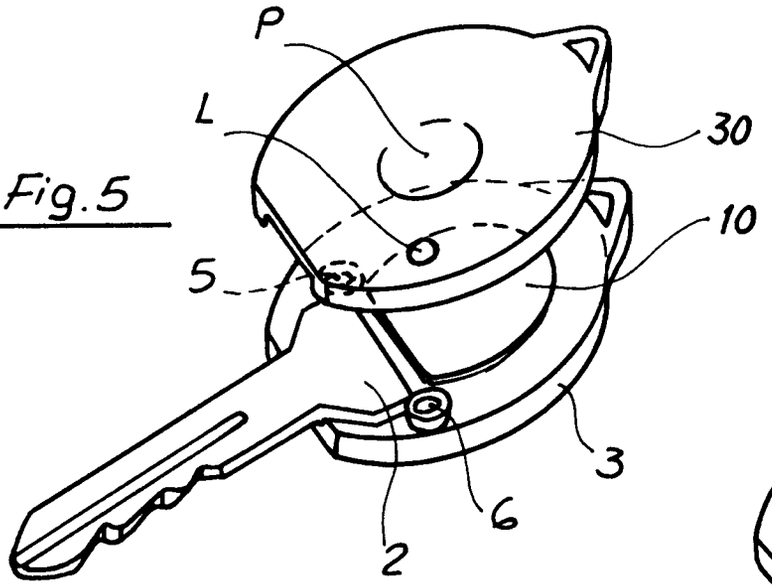


Fig.6

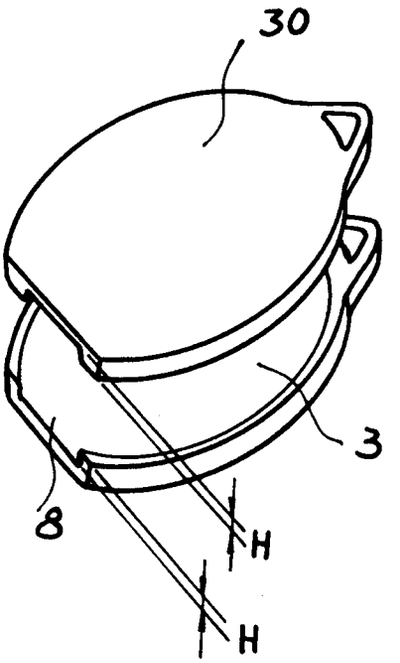
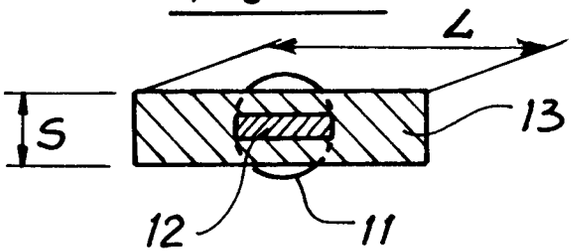


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 94 10 1235

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.5)
Y	DE-A-35 29 752 (MUELLER) * the whole document *	1-6	E05B19/00
Y	DE-A-35 21 417 (MUELLER) * the whole document *	1-6	
A	US-A-4 200 227 (LEMELSON) * abstract; claims; figures *	1-6	
A	FR-A-2 411 650 (HOEBEN) * the whole document *	1-6	
A	BE-A-902 373 (BURTON) * figures *	1-4	
A	EP-A-0 116 868 (WOLTER) * abstract; figures *	1-4	
A	EP-A-0 224 607 (FRITZ FUSS KOM.-GES.) * the whole document *	1	TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A	GB-A-2 155 988 (BAUER KABA AG) * the whole document *	1	E05B
A	US-A-4 726 205 (ALLERDIST ET AL.) * abstract; figure *	1	
E	EP-A-0 582 513 (VALEO SECURITE HABITACLE)	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 April 1994	Giménez Burgos, R

CATEGORY OF CITED DOCUMENTS

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