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(54) **KEYS**

(57) A lever key blank 10 including stacking formations which define a spaced pair of parallel engagement surfaces 30. The parallel engagement surfaces 30 extend beyond or at least as far as the remainder of lever key blank 10 in a direction perpendicular to the surfaces 30.

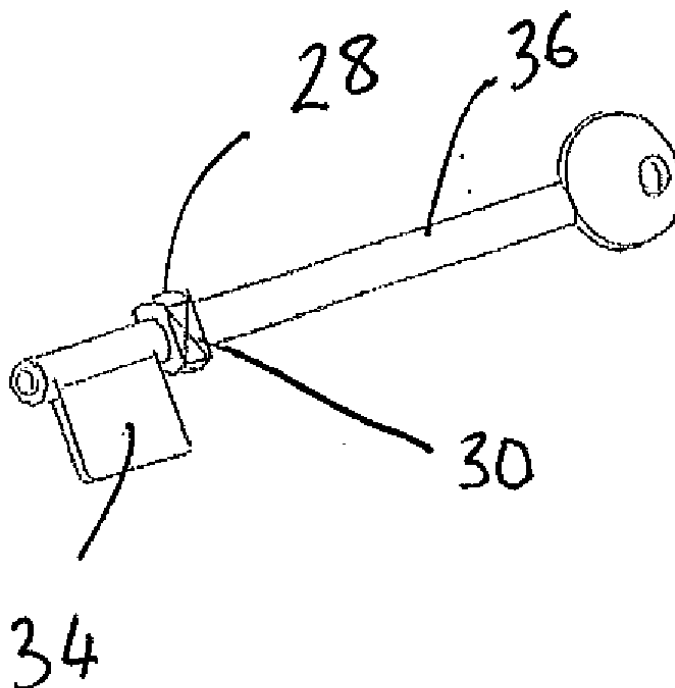


FIG. 9

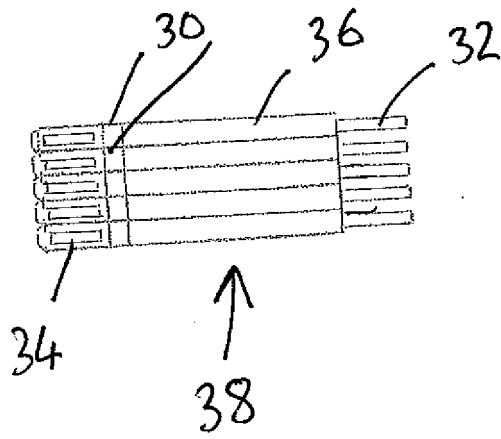


FIG - 10

Description

[0001] This invention concerns lever key blanks and particularly lever key blanks for use in a key cutting machine, a plurality of lever key blanks, a stack of lever key blanks, and also a key cutting machine.

[0002] In for instance key cutting machines it is generally necessary to locate a stack of similar lever key blanks in a magazine, cartridge or elsewhere. With cylinder keys this is generally quite straightforward as such blanks are generally cut from a sheet material.

[0003] With lever keys though it is often problematic to provide a stack of blanks, as the blanks in the stack will tend not to lie flat on each other, and the blanks in a stack will often end up, and especially at the upper end of the stack, being inclined relative to the blanks at the lower end of the stack. The generally cylindrical profile of the shanks and collars of these key blanks also results in the blanks sliding past one another when stacked. This can prove problematic, with blanks becoming jammed for instance in a magazine, cartridge or elsewhere, and can lead to difficulties in handling the lever key blanks, and particularly mechanically.

[0004] Lever keys generally include a head, which is usually flat. A shank, which is usually cylindrical but may in some instances have a non-circular (e.g. polygonal) longitudinal cross section, extends from the head. A cylindrical shank provides the advantage of a smooth rotational support surface whilst the key is turning in a lock, whereas a shank with for instance a rectangular longitudinal cross-section may catch in the lock whilst turning. A cylindrical profile also results in a stronger shank and is therefore less prone to deformation.

[0005] Spaced along the shank is usually a collar which is often cylindrical, but may be frusto conical, and of greater diameter than the remainder of the shank. The collar serves to locate the lever key at a required depth in a lock. A collar which extends around the whole (e.g. cylindrical) or majority of the longitudinal cross section of the shank provides a larger, and therefore more stable abutment surface.

[0006] A blade is usually provided beyond the collar, which blade is again generally flat and usually parallel to the head. The blade is cut so as to activate a particular lock.

[0007] According to a first aspect of the invention there is provided a lever key blank, the blank including stacking formations defining a spaced pair of parallel engagement surfaces which in a direction perpendicular to the surfaces extend beyond or at least as far, as the remainder of lever key blank in that direction.

[0008] The lever key blank may include a shank, and the longitudinal cross section of at least the majority of the shank may be non-rectangular. A portion of the longitudinal cross section of at least the majority of the shank may be rounded. At least the majority of the shank may be cylindrical.

[0009] The lever key blank may include a collar, and

the collar may extend around at least the majority of the longitudinal cross section of the shank.

[0010] The stacking formations may comprise a pair of parallel flat engagement surfaces. Stacking formations may be provided on the collar of the lever key blank.

[0011] The stacking formations may extend for the whole length of the collar. The stacking formations may be in the form of chords relative to the remainder of the circular cross-section of the collar.

[0012] The stacking formations may extend for greater than 2mm along the length of the lever key blank.

[0013] The distance between the stacking formation engagement surfaces may be the same as the shank diameter of the lever key blank.

[0014] The stacking formations may be parallel to the head and/or blade of the lever key blank.

[0015] In a further embodiment the stacking formations may be provided on the head of the lever key blank.

[0016] The stacking formations may be in the form of engagement parts of the key blank head being of a thickness at least equal to the maximum thickness of the remainder of the key blank parallel to the key blank head. the engagement part of the key blank head may be any of:

- a raised rim around the key blank head;
- raised strips on either side of the key blank head;
- a raised portion adjacent the key blank shank;
- a raised portion extending across the key blank head; or
- a raised rim around an opening in the key blank head.

[0017] Alternatively the whole of the key blank head may be of a thickness at least equal to the maximum thickness of the remainder of the key blank parallel to the key blank head, and may be of greater thickness than the remainder of the key blank.

[0018] The engagement part of the key blank head may be of greater thickness than the maximum thickness of the remainder of the key blank parallel to the key blank head.

[0019] In a still further embodiment the stacking formations may be provided on the shank of the lever key blank.

[0020] A still further aspect of the invention provides a plurality of lever key blanks for use in key cutting, the lever key blanks being according to any of the preceding fourteen paragraphs.

[0021] The invention further provides a stack of lever key blanks in a receptacle, the lever key blanks being according to any of said preceding fourteen paragraphs.

[0022] A yet further aspect of the invention provides a key cutting machine including a plurality of stacks of lever key blanks according to any of said preceding fourteen paragraphs in receptacles, with identical lever key blanks in each stack, and stacks of different lever key blanks.

[0023] Embodiments of the present invention will now be described by way of example and with reference to the accompanying drawings, in which:-

Fig. 1 is a diagrammatic plan view of a conventional lever key blank not according to the invention;

Fig. 2 is a diagrammatic side view of the lever key blank of Fig. 1;

Fig. 3 is a diagrammatic end view of the lever key blank of Fig. 1;

Fig. 4 is a diagrammatic perspective view of the lever key blank of Fig. 1;

Fig. 5 is a diagrammatic stack of lever key blanks similar to the lever key blank of Fig. 1;

Figs. 6 - 10 are corresponding views to Figs. 1 - 5, but of a first lever key blank and a stack of first lever key blanks according to the invention;

Fig. 11 is a similar view to Fig. 10 but of a second lever key blank according to the invention;

Fig. 12 is a diagrammatic plan view of the head of the second key blank of Fig. 11; and

Figs. 13 - 17 are similar views to Fig. 12 but respectively of third, fourth, fifth, sixth and seventh key blanks according to the invention.

[0024] Figs. 1 - 5 show a lever key blank 10 of a conventional configuration which is not according to the invention. The lever key blank 10 includes a flat circular head 12 with a through hole 14 for mounting on a keyring or elsewhere. A circular cross-section shank 16 extends from the head 12. Towards the end of the shank 16 away from the key head 12, a cylindrical collar 18 of greater diameter is provided. On the shank 16 beyond the collar 18 from the head 12, a blade 20 is provided. The blade 20 is a square sheet of material parallel to the head 12, and will in practice be cut to a required formation to operate a particular lock. The shank 16 extends for just a short distance beyond the blade 20 and has a frusto conical end 22.

[0025] As indicated, in use the blade 20 would be cut manually or in a machine to a required formation, and can be used to lock or unlock a particular lock mechanism, with the collar 18 generally acting as an abutment to ensure the blade 20 enters the lock mechanism to a required depth.

[0026] As noted, and particularly for instance in a key cutting machine, it may be required to provide a plurality of such lever key blanks 10 in a stack 24 one on top of each, generally with the heads 12 and blades 20 parallel to each other, and such stacks 24 may be provided in a cartridge or other receptacle.

[0027] Fig. 5 indicates a typical problem with such a stack 24 in that the collars 18 are the widest part of the blank 10 in this orientation, and the blanks 10 tend to

pivot about the collars 18 such that the uppermost blank 10 is pivoted at a significant inclination relative to the lowermost blank 10. In practice this can lead to jamming of the blanks 10 in a magazine, cartridge or elsewhere, and/or difficulties in mechanical handling of such blanks 10.

[0028] Figs. 6 - 10 show a first lever key blank 26 according to the invention which is similar to the blank 10 except that in this instance two flat stacking formations are provided on the collar 28 in the form of two flat spaced engagement faces 30 which are parallel to the heads 32 and blades 34. As can be seen the distance between the two flat faces 30 is the same as the diameter of the shank 36.

[0029] Typically the engagement faces 30 could extend for around 4mm along the blank 26, and the diameter of the collar 28 excepting the engagement faces 30, is around 7mm. This means that when the blanks 26 are provided in a stack 38, for instance in a magazine or cartridge in a key cutting machine or similar, the blanks 26 will align in a parallel alignment as shown in Fig. 10.

[0030] Therefore this relatively small change from a conventional lever key blank, which may otherwise be difficult to stack, provides significant advantages, making such blanks able to be readily and reliably used for instance in a key cutting machine and other applications.

[0031] Figs. 11 and 12 show a third key blank 40. In this instance the stacking formations are provided in the key blank head 42, in that the key blank head 42 is of increased thickness such that the thickness of the head 42 is equal to the other part of the key blank 40 of greatest thickness, which is the collar 44. In this instance the collar 44 may also have flat parallel engagement faces, or could be provided with a conventional cylindrical profile. As can be seen in Fig. 11, the key blanks 40 form a stack of parallel blanks by virtue of the thickness and parallel sides of the head 42.

[0032] Figs. 13 to 17 show the heads respectively of third, fourth, fifth, sixth and seventh key blanks 46, 48, 50, 52, 54, where only part of the key blank head is of increased thickness but will provide the stacking effect as shown in Fig. 11.

[0033] The key blank head 56 of the third blank 46 shown in Fig. 13 has a raised rim 58 of increased thickness. The key blank head 60 shown in Fig. 14 of the fourth key blank 48 has raised portions 62 either side of the key blank head 60.

[0034] The key blank head 64 of the fifth key blank 50 shown in Fig. 15, has a raised portion 66 adjacent to the shank to provide the increased thickness. The key blank head 68 of the sixth key blank 52 shown in Fig. 16, has a raised band 70 extending transversely across the head, which band 70 could for instance show the logo and/or name of the key blank manufacturer or supplier.

[0035] In the key blank head 72 of the seventh key blank 54 shown in Fig. 17, a raised rim 74 is shown around a conventional hole 76 provided in the key blank 72 head for mounting a key on a key ring or otherwise.

[0036] It is to be realised that a number of other modifications may be made without departing from the scope of the invention. For instance the distance between the blanks could be greater than the diameter of the shank. In some instances stacking formations could be provided elsewhere on a lever key blank, such as along the shank. Providing the distance between the stacking formations the same as the shank diameter is though advantageous in readily providing a stack. In practice though with a stack of blanks where the distance is greater than the shank diameter, the weight of keys in the stack will urge them to a parallel alignment as shown for instance in Fig. 11. In some instances, the shank may not be cylindrical, for example a shank with a pentagonal longitudinal cross section could be provided. The collar of the lever key could extend around a part, the majority, or the whole of the longitudinal cross section of the shank.

[0037] Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

Claims

1. A lever key blank, the blank including stacking formations defining a spaced pair of parallel engagement surfaces which in a direction perpendicular to the surfaces extend beyond or at least as far, as the remainder of the lever key blank in that direction. 30
2. A lever key blank according to claim 1, in which the lever key blank includes a shank. 35
3. A lever key blank according to claim 2, in which the longitudinal cross section of at least the majority of the shank is non-rectangular. 40
4. A lever key blank according to claims 2 or 3, in which a portion of the longitudinal cross section of at least the majority of the shank is rounded. 45
5. A lever key blank according to claim 2, in which at least the majority of the shank is substantially cylindrical. 50
6. A lever key blank according to any of the preceding claims, in which the lever key blank includes a collar. 55
7. A lever key blank according to claim 6, in which the collar extends around at least the majority of the longitudinal cross section of the shank.
8. A lever key blank according to any of the preceding claims, in which the stacking formations comprise a

pair of parallel flat engagement surfaces.

9. A lever key blank according to any of claims 6 to 8, in which stacking formations are provided on the collar of the lever key blank. 5
10. A lever key blank according to claim 9, in which the stacking formations are in the form of chords relative to the remainder of the circular cross-section of the collar. 10
11. A lever key blank according to any of claims 1 to 8, in which the stacking formations are provided on the head of the lever key blank. 15
12. A lever key blank according to any of claims 2 to 8, in which the stacking formations are provided on the shank of the lever key blank. 20
13. A plurality of lever key blanks for use in key cutting, the lever key blanks being according to any of the preceding claims. 25
14. A stack of lever key blanks in a receptacle, the lever key blanks being according to any of claims 1 to 12.
15. A key cutting machine including a plurality of stacks of lever key blanks according to any of claims 1 to 12 in receptacles, with identical lever key blanks in each stack, and stacks of different lever key blanks.

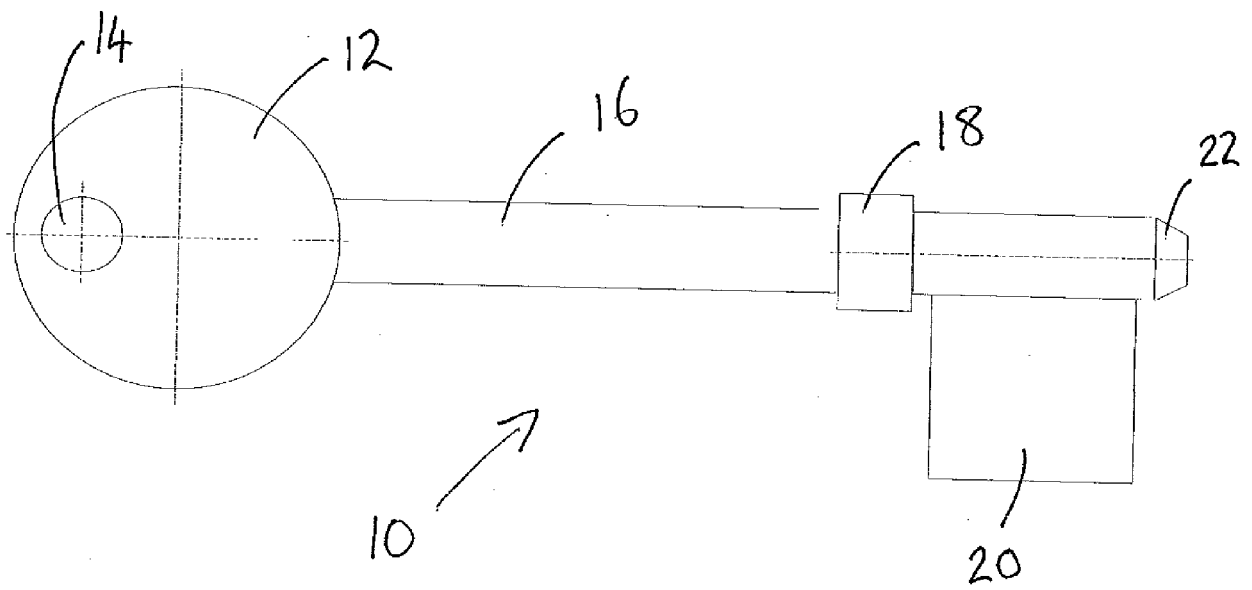


FIG. 1.

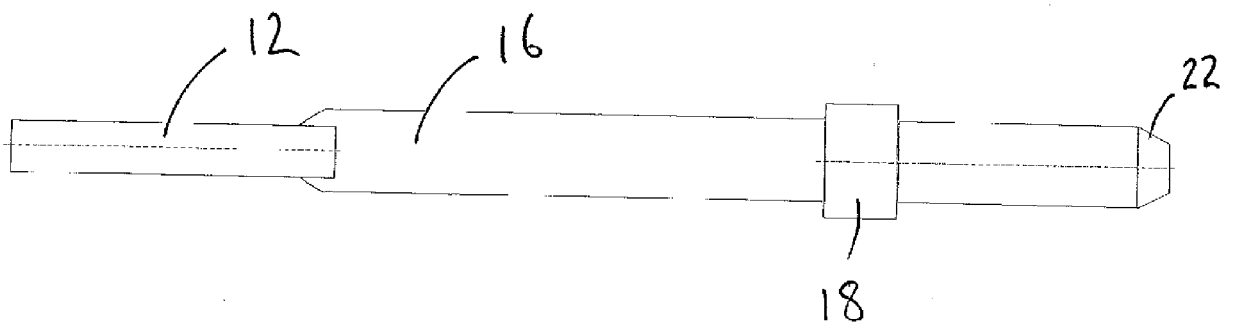


FIG. 2

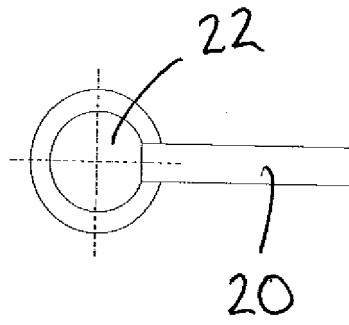


FIG. 3.

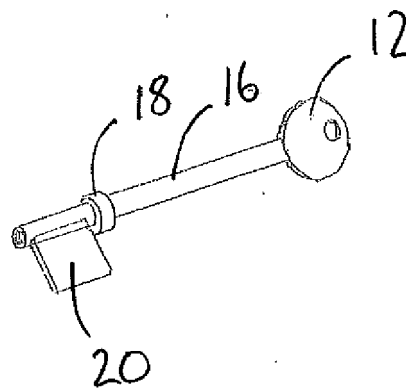


FIG. 4

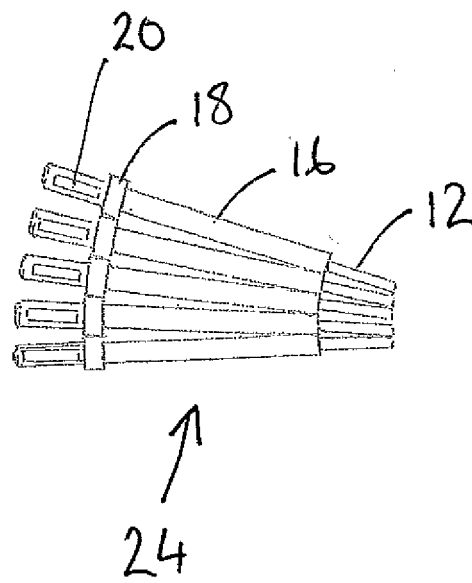


FIG. 5

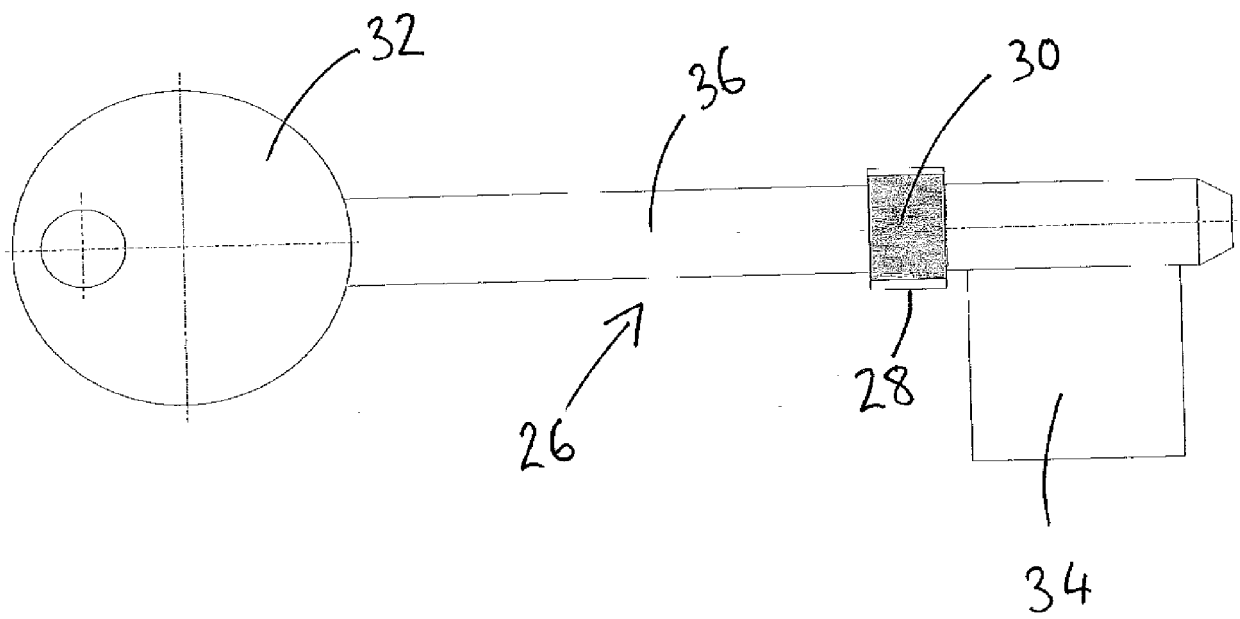


FIG. 6

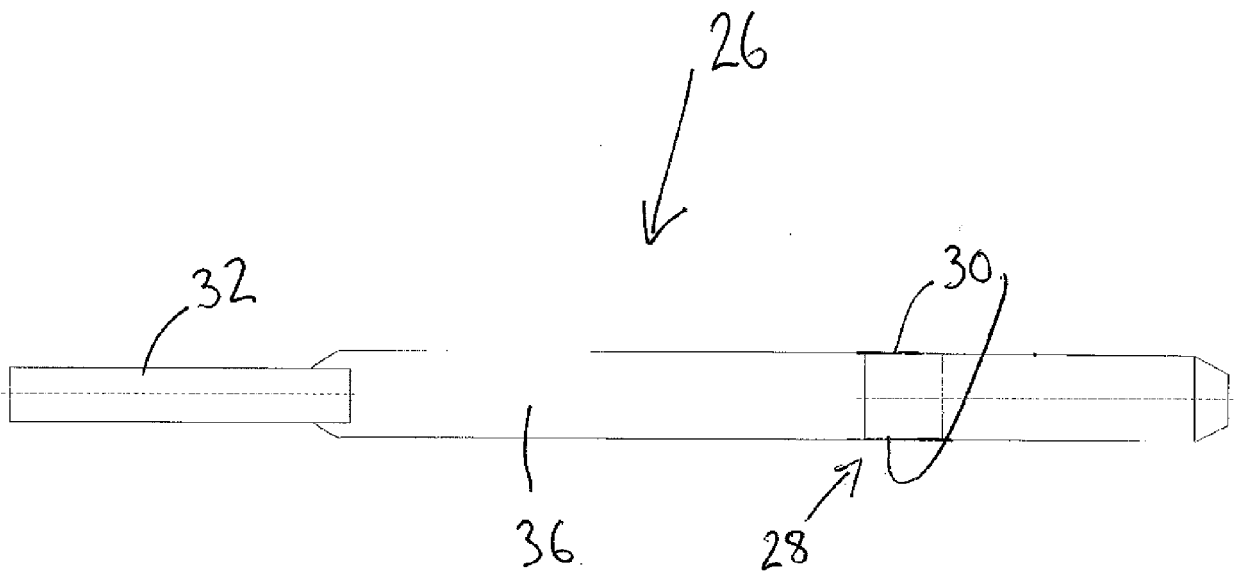


FIG. 7

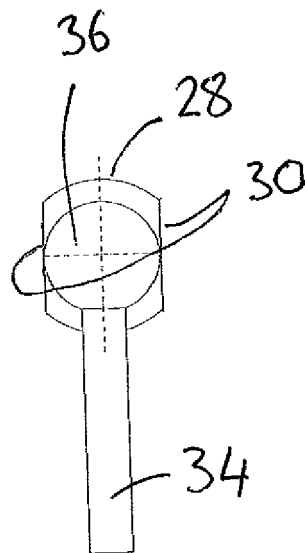


FIG. 8

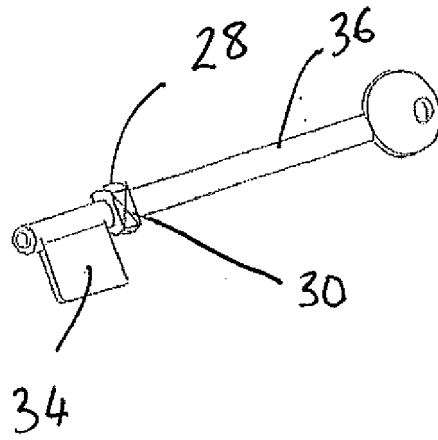


FIG. 9

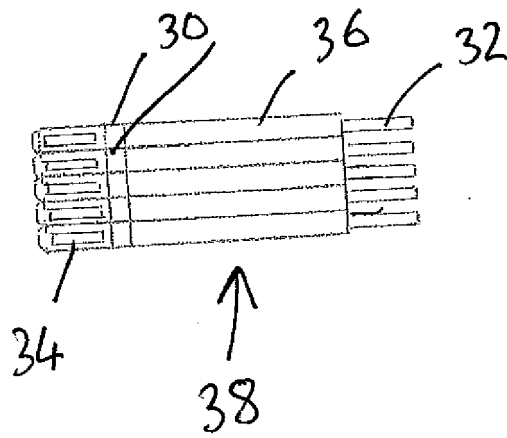


FIG. 10

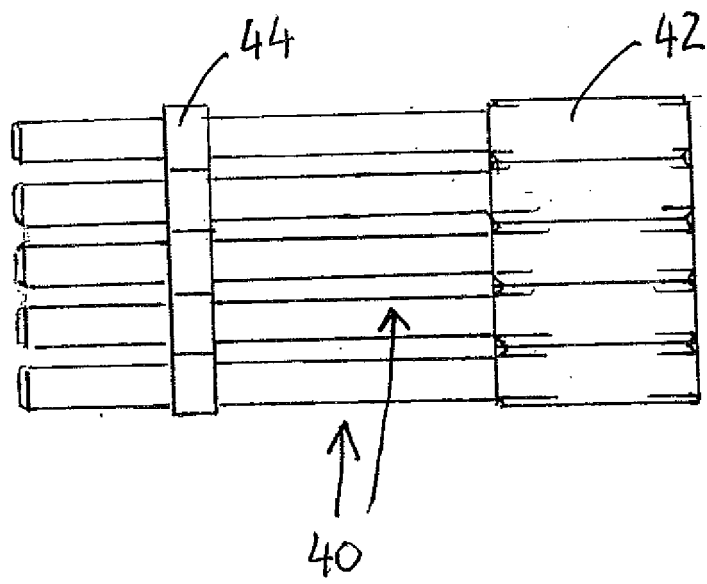


FIG. 11.

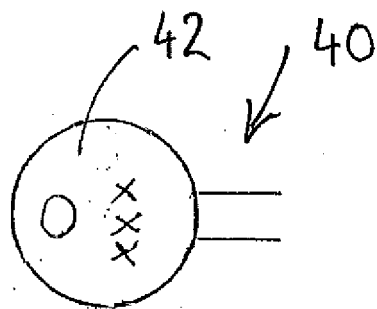


FIG. 12

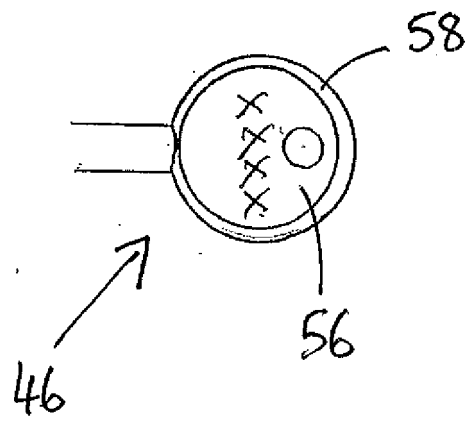


FIG. 13

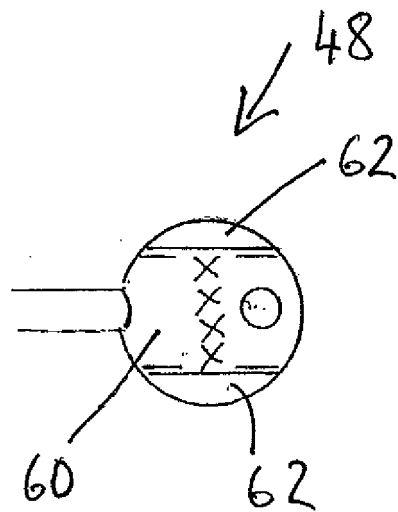


FIG. 14

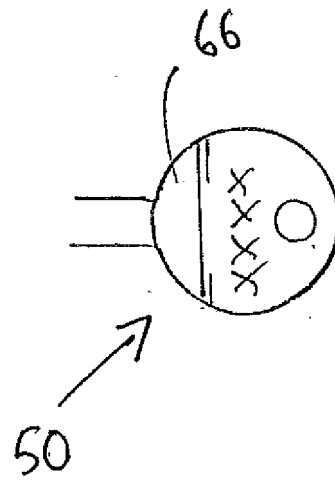


FIG. 15

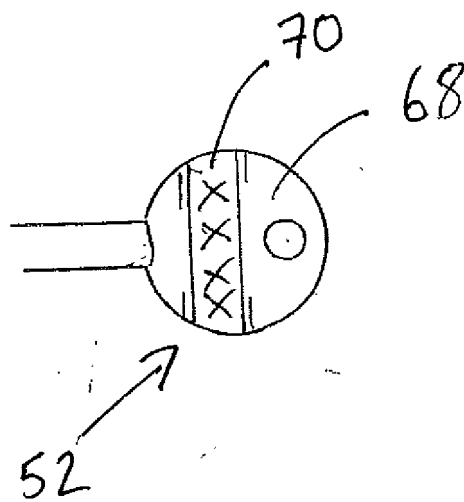


FIG. 16

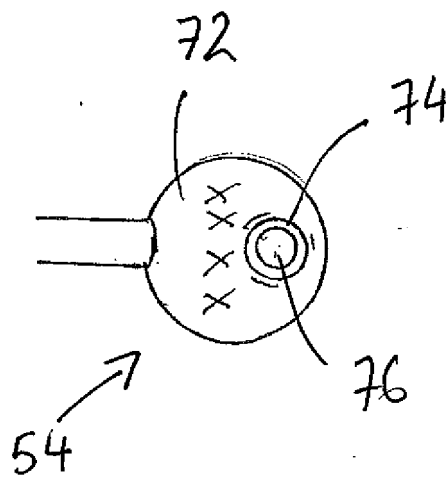


FIG. 17



EUROPEAN SEARCH REPORT

Application Number
EP 18 16 8334

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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X	WO 2005/085567 A1 (ASSA ABLOY LTD [GB]; ALMBLAD ROBERT [US]; BLIN JOHN [US]) 15 September 2005 (2005-09-15) * page 5, line 17 - page 6, line 22; figures 1, 1a *	1-15	
X	DE 20 2009 001921 U1 (SCHULTE SCHLAGBAUM AG [DE]) 22 July 2010 (2010-07-22) * the whole document *	1-15	
X A	DE 86 15 345 U1 (-) 31 July 1986 (1986-07-31) * figures 1, 2 *	1-5,8, 11,13-15 6,7,9, 10,12	TECHNICAL FIELDS SEARCHED (IPC) E05B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 September 2018	Examiner Cruyplant, Lieve
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18-09-2018

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