- intersection of the upper or lower leg of the paracentric profile groove with the key side surface to the opposite profile groove, to an imaginary line extending from the intersection of upper or lower leg of the opposite profile groove with the key side surface extends to the paracentric profile groove, has a vertical distance.

[0010] According to an aspect of the present invention, there is provided a flat key profile for a lock and key system, in which a key channel corresponding to the key profile is provided in the lock cylinder, the flat key profile of a key shank having an upper profile portion facing a key back and a lower profile portion facing the key face, notches being provided which project into the lower profile portion starting from the key face in the key-shank plane, , a triangular, paracentric profile groove that projects above the center plane of the key shank being provided in the lower profile portion in one side surface of the key shank, a triangular profile groove arranged above or below the opposite paracentric profile groove being provided on the opposite side surface of the key shank, a profile base of which profile groove is at a horizontal distance from the profile base of the opposite paracentric profile groove, an arrangement of the paracentric profile groove in relation to the opposite profile grooves being such that an imaginary line which extends perpendicularly with respect to the key shank plane from the point of intersection of the upper or lower leg of the paracentric profile groove with the key side surface to the opposing profile groove is at a vertical distance from an imaginary line which extends from the point of intersection of the upper or lower leg of the opposite profile groove with the key side surface to the paracentric profile groove, wherein the paracentric triangular profile groove has at least one of a first shoulder in the upper leg with which a second shoulder in the lower leg of the opposite upper triangular profile groove is associated, or at least one of a third shoulder in the lower leg with which a fourth shoulder in the upper leg of the opposite lower triangular profile groove is associated, wherein each of the first, second, third and fourth shoulders begins at an imaginary point of intersection of the triangular profile groove with the key outer surface and has a minimum depth of 1/3 of the triangular profile groove.

[0011] Two opposing profile features are used, which are triangular (V-shaped). The profile features are symmetrical and have radii in their base.

[0012] If two opposing features are now arranged so that they are very close to each other with profiles milled right-angled, then the key would break in this area. The minimum overlap should be 0.2mm and the maximum residual thickness 0.3mm. In order to produce the triangular cuts (profile features) economically, the deeper notch should have an angle of a = 110 °.

[0013] There must be at least two incisions that are offset from each other. Starting from the deeper incision, either "above" or "below" this one further incision must be present.

[0014] Since, as mentioned above, the copying machine with a rectangular milling disc cannot produce a V-shaped profile groove, the profile groove must be milled rectangular as a replacement, whereby it is inevitably wider.

[0015] Since, however, according to embodiments of the invention further arrangement relationships or features must be taken into account, this leads to the key shank becoming too thin at certain points, so that it breaks during the copying process or at the latest during use.

[0016] Thus, the disadvantage of mechanical profile copying machines is exploited, so that the copied key is not usable. Even copying with 3D filament printers is made much more difficult by the bevels, as here the bevels can only be generated stepwise.

[0017] The invention will be explained in more detail with reference to the drawings.

[0018] Showing:

Fig. 1 a partial side view of a key with head and profiled shaft,

Fig. 2 a cross section through the profiled shaft and

Fig. 3 a modified embodiment in cross section.

[0019] The key shaft is labeled 1. From the key side surface, the deeper profile groove 2 goes out, which extends paracentrally over the median plane. The profile groove 2 is formed symmetrically and has the angle alpha (a). Likewise, the profile grooves are formed "over" and "under" the profile groove 2 on the other key side. These are marked 3 and 4 and have an angle beta (b). At the bottom of the incisions, there is a radius (R). To the three incisions each with dashed lines 5, 6, 7 is drawn a rectangle that represents the rectangular incisions by means of a mechanical profile copying machine.

[0020] In detail, the arrangement of the paracentric profile groove with respect to the opposite profile grooves is such that an imaginary line 7, perpendicular to the key plane from the intersection of the upper or lower leg of the paracentric profile groove with the key side surface to the opposite profile groove, to an imaginary line 5, which extends from the intersection of the upper or lower leg of the opposite profile groove with the key side surface to the paracentric profile groove, a vertical distance 9 has.

[0021] This results in horizontal and vertical distances. The horizontal distance 8 should be a maximum of 0.3mm, the vertical coverage 9 minimum 0.2mm. The angle alpha from the deeper incision should be 110 °. The radius R should be 0.2mm. The angle beta is freely selectable according to the distances 8 and 9. The incisions (profile features) should preferably lie in the "lower" area of the key, ie in which - starting from the key breast - is notched.

CLAIMS

1. Flat key profile for a lock and key system, in which a key channel corresponding to the key profile is provided in the lock cylinder,

the flat key profile of a key shank having an upper profile portion facing a key back and a lower profile portion facing a key face,

notches being provided which project into the lower profile portion starting from the key face in the key-shank plane,

a triangular, paracentric profile groove that projects above the center plane of the key shank being provided in the lower profile portion in one side surface of the key shank,

a triangular profile groove arranged above or below the opposite paracentric profile groove being provided on the opposite side surface of the key shank, a profile base of which profile groove is at a horizontal distance from the profile base of the opposite paracentric profile groove,

an arrangement of the paracentric profile groove in relation to the opposite profile grooves being such that an imaginary line which extends perpendicularly with respect to the key shank plane from the point of intersection of the upper or lower leg of the paracentric profile groove with the key side surface to the opposing profile groove is at a vertical distance from an imaginary line which extends from the point of intersection of the upper or lower leg of the opposite profile groove with the key side surface to the paracentric profile groove,

wherein the paracentric profile groove has at least one of a first shoulder in the upper leg with which a second shoulder in the lower leg of the opposite upper triangular profile groove is associated, or at least one of a third shoulder in the lower leg with which a fourth shoulder in the upper leg of the opposite lower triangular profile groove is associated,

wherein each of the first, second, third and fourth shoulders begins at an imaginary point of intersection of the triangular profile groove with the key outer surface and has a minimum depth of 1/3 of the triangular profile groove.

2. Flat key profile according to claim 1, wherein the depth of individual notches extends to the bottom of the lowest profile groove facing the key face.

3. Flat key profile according to claim 1, wherein the profile grooves have a radius in the profile base.

4. Flat key profile according to any one of the preceding claims, wherein the angle a between the leg of the paracentric profile groove and the key side surface is 110°.

5. Flat key profile according to any one of the preceding claims, wherein the angle b between the leg of the opposite profile groove and the key side surface is variable.

6. Flat key profile according to any one of the preceding claims, wherein the horizontal distance is a maximum of 0.3 mm and the vertical overlap is a minimum of 0.2 mm.

7. Flat key profile according to any one of the preceding claims, wherein each of the first, second, third and fourth shoulders have a symmetrical or asymmetrical depth.

8. Flat key profile according to any one of the preceding claims, wherein a profile groove is provided above and below the opposite paracentric profile groove.

9. Flat key profile according to any one of the preceding claims, wherein the first shoulder and the third shoulder are disposed on the upper and lower leg of the paracentric profile groove, the second shoulder disposed on the opposite upper triangular profile groove and the fourth shoulder disposed on the opposite lower triangular profile groove.