July 28, 1959 W. P. PEKLAY 2,896,345

TOOTH ASSEMBLY

Filed July 23, 1954

Fig. 1

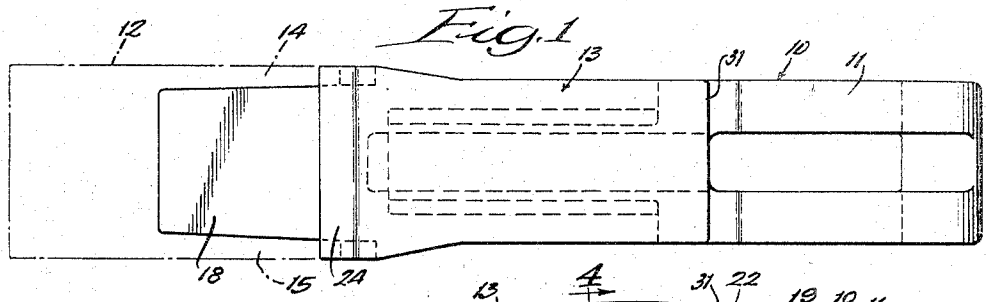


Fig. 2

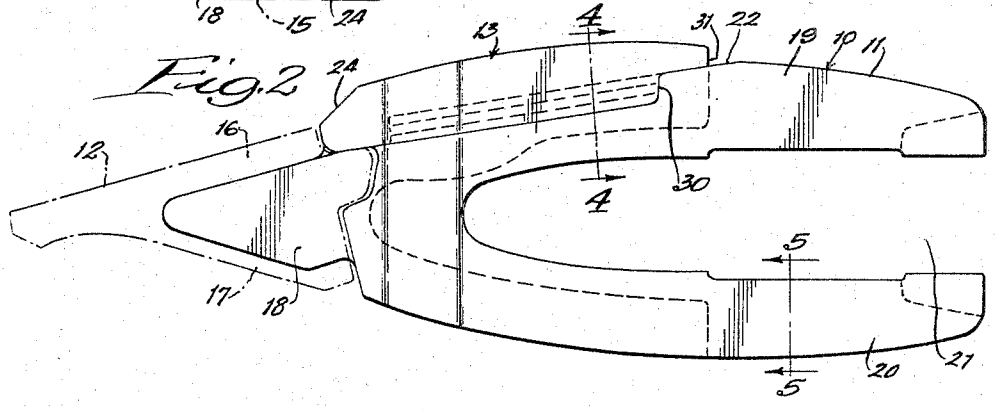


Fig. 3

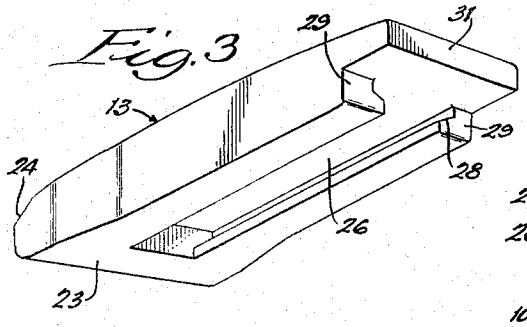


Fig. 4

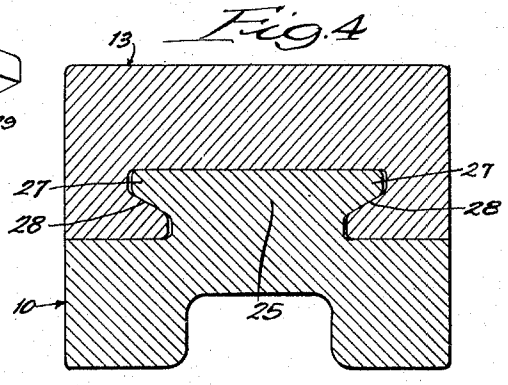
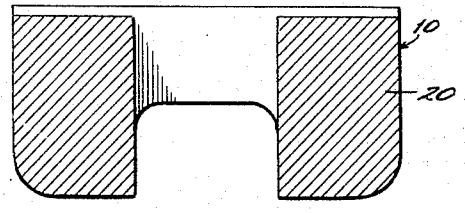


Fig. 5



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TOOTH ASSEMBLY

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Application July 23, 1954, Serial No. 445,337

4 Claims. (Cl. 37—142)

This invention relates to a tooth assembly, and more particularly to an adaptor and replaceable wear cap therefor. The invention is useful in digging and picking apparatus, and especially with apparatus wherein severe abrasion conditions are encountered.

In certain applications, particularly in the mining of copper, the tooth assembly is subjected to very severe abrasion especially on the top or wear surface thereof. This condition persists if the tooth assembly is a solid tooth or is one having a point secured to an adaptor. Generally, the point is hardened to a considerable degree, and it has been found in many cases that the point outwears the adaptor or base of the tooth assembly. The reason for this is that the base or adaptor, because of design conditions, must be formed from a strong, ductile material. For example, the Brinell hardness range for the adaptor is ordinarily held within the range of 240 to 280. This hardness range does not provide the degree of hardness necessary to withstand the abrasion conditions encountered in the mining of copper, etc. On the other hand, the point may have a Brinell hardness range of 444 to 512, and in this range very good wearing qualities are provided. The most severe wearing of the adaptor occurs along the top surface thereof, and it is clear that some means for increasing the hardness and resistance to abrasion along that surface would be desirable.

It is, accordingly, an object of this invention to provide a tooth assembly wherein the resistance to abrasion and wearing qualities are considerably improved, especially the wearing qualities of the base or adaptor member. Another object is in the provision of a tooth structure having an adaptor and tooth point secured thereto, the adaptor being equipped with a replaceable wear cap highly hardened to provide resistance to abrasion. Still another object is in the provision of a tooth assembly having an adaptor that releasably carries a tooth or box point, the adaptor being equipped with a hardened removable wear cap that is locked in part on the adaptor by the box point.

A further object is in providing an adaptor, useful in a tooth assembly, that is equipped with a removable wear cap, the adaptor and cap having complementary interlocking connections preferably in the form of a tapered slot and tongue so that the cap, while being removable, is securely anchored to the adaptor when mounted thereon. Additional objects and advantages will appear as the specification proceeds.

An embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a top plan of a tooth assembly embodying the invention; Figure 2 is a side view in elevation of the tooth assembly; Figure 3 is a perspective view of the wear cap; Figure 4 is a transverse sectional view taken on the line 4—4 of Figure 2; and Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 2.

The tooth assembly indicated generally with the numeral 10 comprises a base or adaptor 11, a tooth point

or box point 12 and a removable wear cap or shroud 13. The box point 12 and the cap 13 are both removably mounted upon the adaptor 11. The adaptor in turn is designed to be mounted upon and secured to digger or picker apparatus used, for example, in the mining of copper.

The point 12 is provided with side walls 14 and 15 and has a relatively straight top wall 16 and a downwardly and rearwardly inclined bottom wall 17. All of the walls merge adjacent the forward end of the point and are preferably formed integrally therewith. Toward the rear of the point, the walls are spaced apart and provide a tapered chamber therebetween, as is seen best in Figure 2. The point 12 will be treated so that it is relatively hard and can be used for long periods even where severe abrasion conditions are encountered.

The adaptor 11 is equipped at its forward end with a nose 18 that has a taper so that it is received snugly within the chamber provided by the box point 12. Rearwardly the adaptor 11 is provided with a pair of spaced-apart shank members 19 and 20 that provide an opening 21 therebetween adapted to receive the lip of a bucket or other structure upon which the adaptor will be mounted. The adaptor 11 is a cast member that is conditioned so that it is strong and ductile and is able to withstand the rigorous usage encountered in digging and picking, etc. The character of the adaptor 11, however, is not such that it is able to withstand with any facility any considerable abrasion.

The cap or shroud 13 is an elongated member adapted to extend over and enclose the forward portion of the top wall 22 of the adaptor 11. As is shown in Figure 1, the cap 13 conforms closely in transverse dimensions to the configuration of the top wall 11. It has, then, a widened forward end portion 23 that has a downwardly and forwardly inclined wall 24. The cap 13 will be heat treated to a high hardness so that it will be resistive to severe abrasion conditions.

Means are provided for removably securing the cap 13 to the top wall 22 of the adaptor. The means employed provide interlocking connectors whereby the cap is held against vertical and transverse horizontal movement relative to the adaptor. Means are also provided to prevent horizontal movement of the cap along the longitudinal axis of the adaptor, and in one direction such movement is prevented by the box point 12.

Preferably, the mounting means for the cap 13 comprises a tapered tongue 25 formed integrally with the shank 19 of the adaptor, and which forms a raised portion or tongue along the top wall 22 of the adaptor. The mounting means also includes a complementary tapered slot or channel 26 provided by the cap 13 along the bottom wall thereof. As is shown best in Figure 4, the tongue 25 has outwardly and upwardly diverging wall portions 27 that are slidably received within the channels provided by the upwardly and outwardly diverging walls 28 of the slot 26. The tongue 25 is slidably receivable within the slot 26 when the cap 13 is moved along the top wall 22 of the adaptor from front toward the rear thereof.

The slot 26 terminates short of the rear edge of the cap 13 and the ends 29 of the slot walls are adapted to abut the shoulder 30 provided by the adaptor 11. The flange 31 or rear end portion of the cap 13 extends over the ends of the channel walls and over the abutment 30, and is adapted to cover and engage a portion of the top wall 22 of the adaptor beyond the tongue 25. The shoulder 30, then, cooperates with the ends 29 of the slot walls and prevents rearward movement of the cap 13 relative to the adaptor beyond the point where the shoulder 30 and wall ends 29 abut.

When the cap 13 is in position, especially as shown

in Figure 2, the forward end **23** thereof extends over the nose **18** of the adaptor and is adapted at its forward edge to substantially abut the rear edge of the wall **16** of the box point. Thus, when the box point is in position upon the nose **18**, it prevents longitudinal movement of the cap relative to the adaptor and toward the nose end thereof.

In use of the tooth assembly described, the adaptor **11** is secured to appropriate apparatus, and the wear cap **13** is secured in position upon the adaptor for sliding the tongue **25** into the slot **26**. The interlocking tongue and slot arrangement, in combination with the stop means or abutment between the wall ends **29** and shoulder **30**, anchor the cap upon the adaptor and prevent relative movement therebetween, except toward the forward end of the adaptor. The box point **12** is then mounted upon the nose **18** of the adaptor, and the structure by which that mounting is accomplished may take varied forms, and since many are well known in the art they will not be described and none has been shown in the drawing. When in position, the box point **12** prevents forward movement of the cap **13** because of the substantial abutment between the end of the wall **16** of the box point and the end portion **23** of the cap. Thus, the cap is firmly anchored in position upon the adaptor and cannot be dislodged therefrom.

In the event that the cap **13** becomes worn excessively, replacement thereof can be made quickly and easily by simply removing the box point **12** and sliding the cap **13** from the tongue **25**.

In certain applications, as for example in mining copper, considerable abrasion and wear occur along the top wall of the adaptor. Even though the adaptor cannot be hardened to withstand such abrasion because it must remain strong and ductile, the hardened cap **13** extends over and protects the adaptor along the top wall thereof, and since it is treated to withstand considerable abrasion, the life of the tooth assembly is substantially increased.

While in the foregoing specification, an embodiment of the invention has been set out in considerable detail for purposes of illustration, it will be apparent to those skilled in the art that numerous changes may be made in these details without departing from the spirit and principles of the invention.

I claim:

1. In a tooth assembly, an adaptor for mounting on the lip of digging apparatus, or the like, said adaptor terminating forwardly in a nose portion adapted to receive a point thereon, a point on said nose portion and removable therefrom by forwardly exerted pressures, said adaptor having a longitudinally-extending tongue integral with the top wall thereof and forwardly terminating a spaced distance from the rearward end of said point, said adaptor having a vertically-extending shoulder in the top wall thereof at the rearward end of said tongue, and a wear-resistant cap provided in its bottom wall with a longitudinally-extending slot open at one end for slidably receiving said tongue therein, the slot-defining side walls of said cap terminating a spaced distance from the rearward end thereof, whereby a step portion complementary to said shoulder is provided and said rearward end of said cap overlies the top wall of said adaptor rearward of said shoulder.

2. In a tooth assembly, an adaptor having a transversely-stepped top wall, a point-receiving nose portion on said adaptor, a point removably mounted on said nose portion, a longitudinally-extending tongue centrally positioned in the forward portion of said top wall extending from the step portion to a position spaced from the rearward edge of said point, and a wear-resistant cap having a longitudinally-extending slot in the bottom wall thereof receiving said tongue, said cap extending from said point rearward edge to a position rearward of said step portion and being substantially non-movable in a rearward direction along said adaptor.

3. In a tooth assembly, an adaptor adapted to project forwardly from the lip of digging apparatus, said adaptor having a point removably mounted on the forward portion, the top wall of said adaptor being equipped with a longitudinally-extending, centrally disposed tongue commencing a spaced distance from the rearward edge of said point and extending over only a portion of the remaining rearward length of said adaptor, the adaptor thereby being equipped with a pair of spaced-apart, vertically-extending shoulders, and a wear-resistant cap having a longitudinally-extending slot open at only one end thereof and in the bottom wall of said cap, the top wall of said tongue and the top wall of said adaptor immediately rearward of said tongue being flush, whereby said cap extends above said top walls and presents a vertically-extending rearward edge adapted to receive blows for disassembly of said point and cap from said adaptor.

4. The structure of claim 3, in which the forward end of said cap is longitudinally tapered in the area between the rearward edge of said point and the forward edge of said tongue.

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