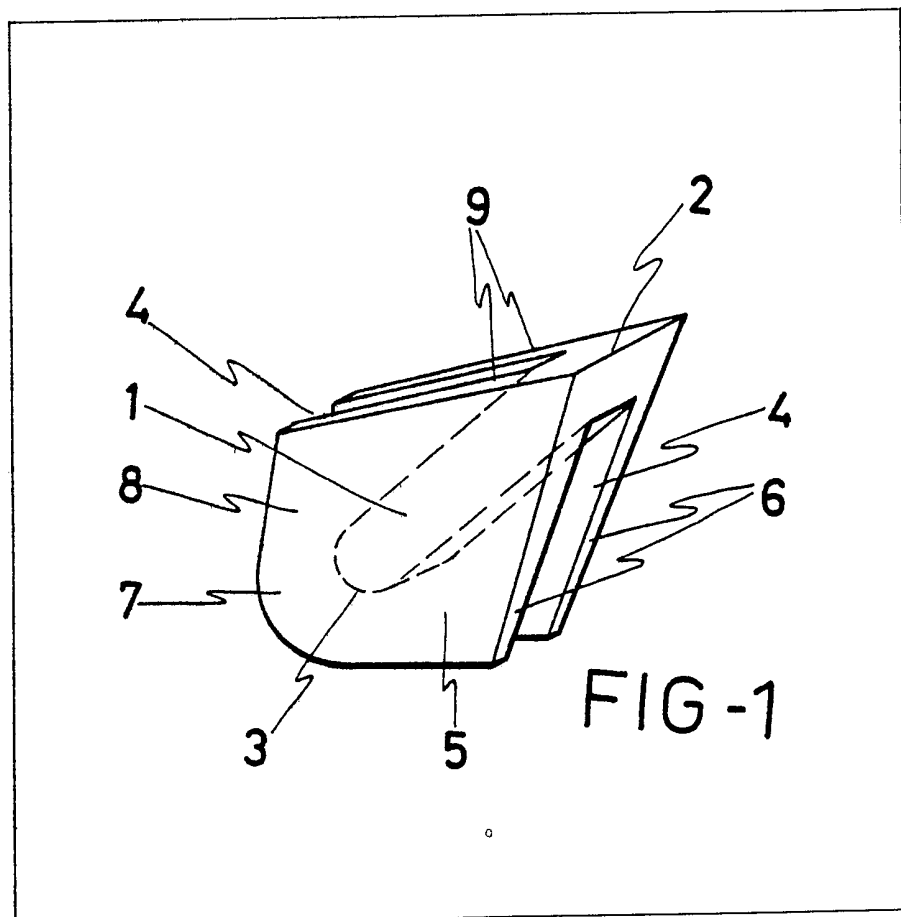
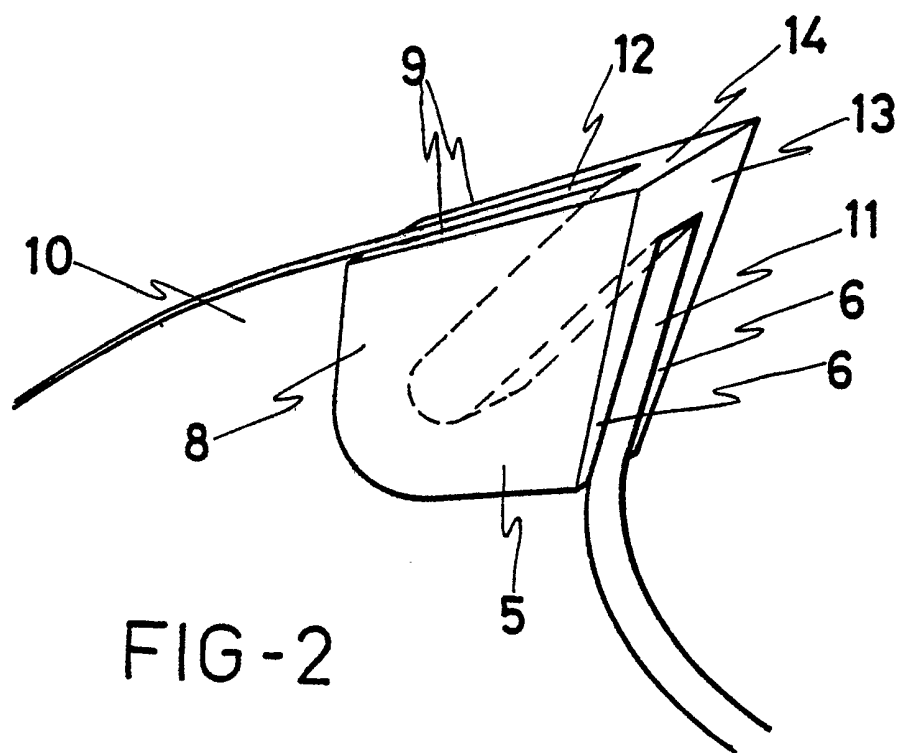
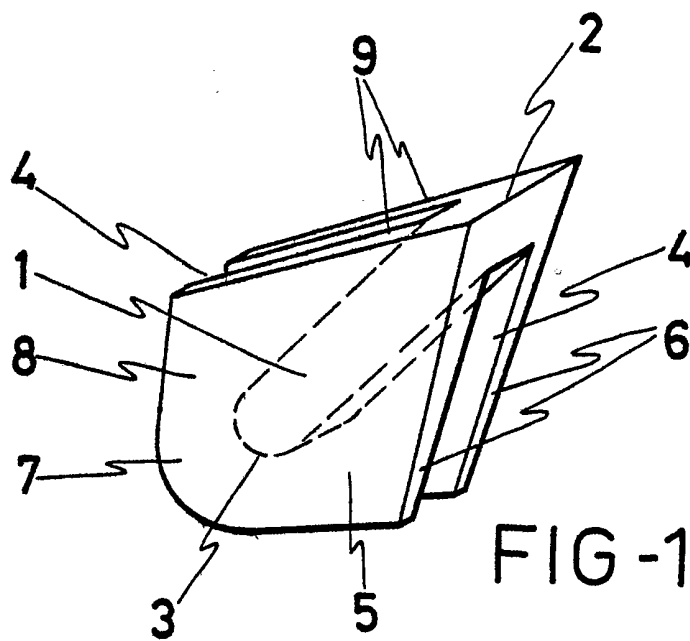


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(54) Reinforcing tip for a sawtooth

(57) The tip includes a core 1 adapted to be received in a groove in the tooth body, the core being shaped at one end 2 to form the tooth edge and being rounded at its other end 3 for location in the groove. Convergent lateral faces 5 define the lateral reliefs and overlap the edges of the groove. The construction of the tip enables successive grinding operations to be carried out on the saw tooth.





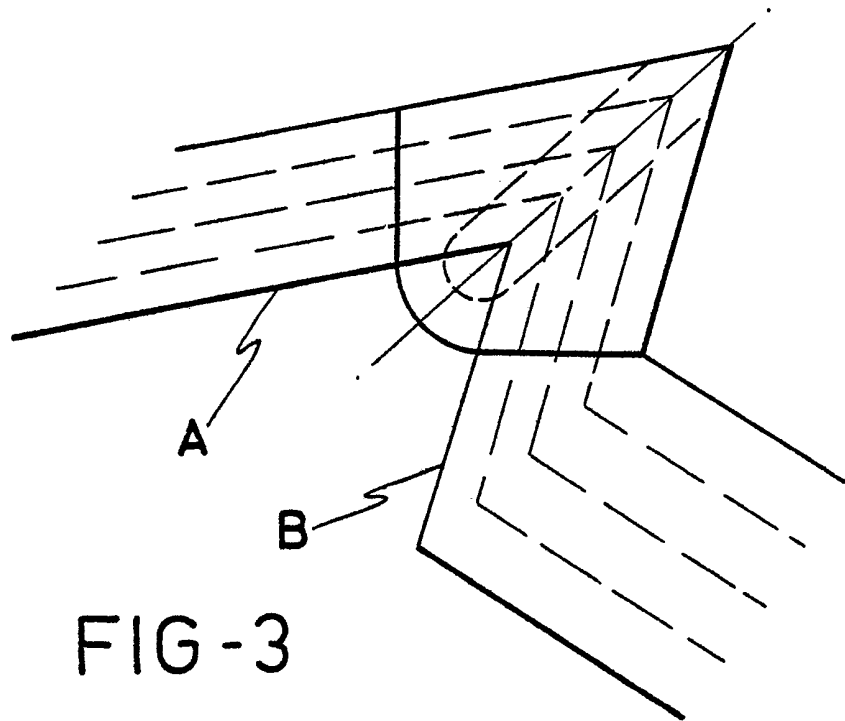


FIG-3

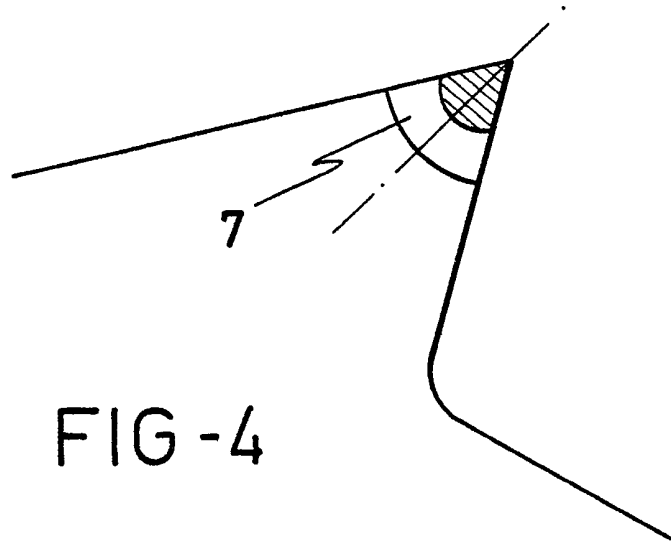


FIG-4

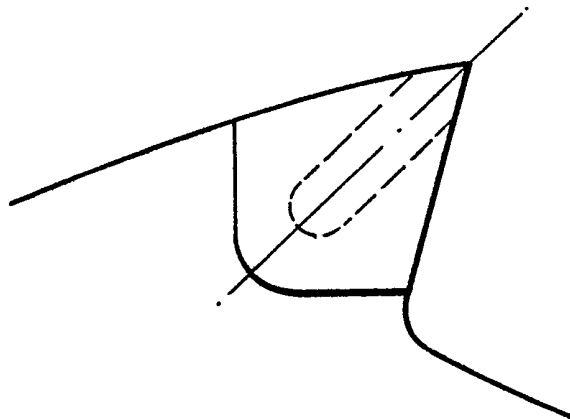


FIG - 5

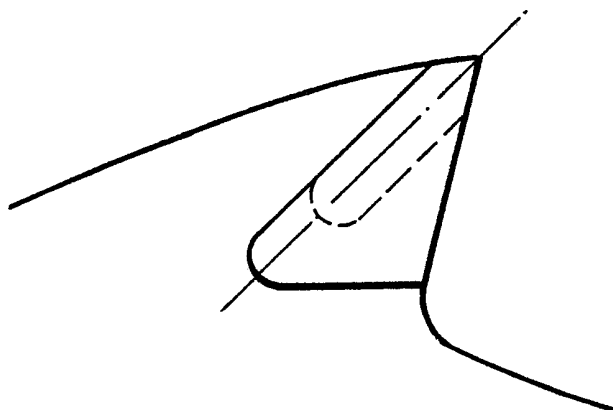
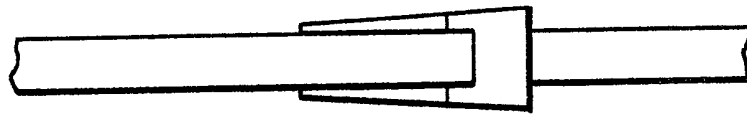
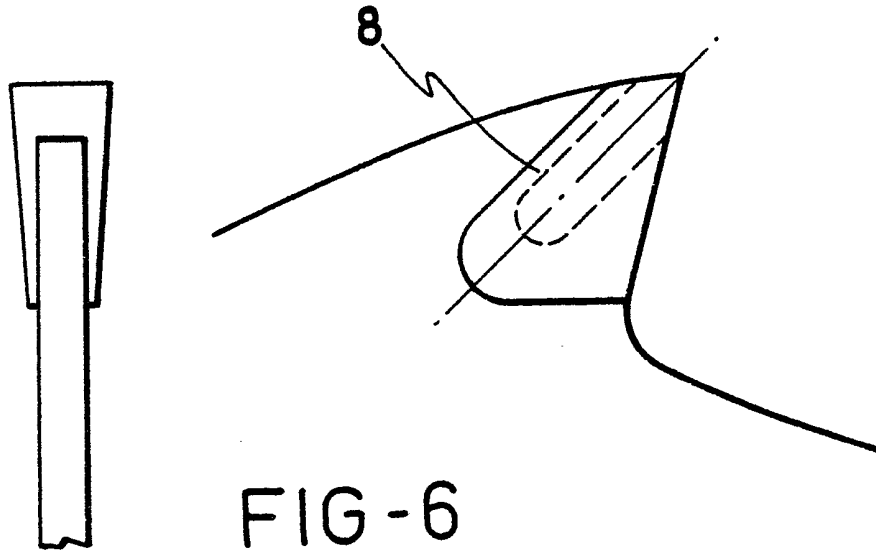


FIG - 7





SPECIFICATION

Reinforcing element for saw teeth

5 The known technique applied to the manufacture of saws and more specifically to the manufacture of band saws has endeavoured, through continuous studies and practical tests, to solve the problem of the teeth of these saws in regard to achieving the most perfect sawing possible with optimum performance and minimum upkeep.

It is known that a saw tooth is reinforced by material harder than that of the tooth itself.

Many methods are employed to achieve this reinforcement. For example, insertion of a piece of hard metal that replaces the point of the tooth.

The result in certain cutting tools, apart from their cost of assembly and/or manufacture, are good in the specific application to cutters and circular and chain saws in which the support of the teeth has machinable dimensions.

The big problem that has not been solved up to now is the application of the said reinforcing element to band saws, due to the fact that in its operation the band saw is subjected to very considerable flexing stresses, since it is continuously transported on the guide elements of the sawing apparatus.

The flexibility of the band of the saw is reduced by the tooth reinforcing element, thus accelerating fatigue and causing the formation of cracks which make the saw unusable after being operated for a short time.

A solution adopted in order to reinforce the teeth of band saws and which has given the best results up to now is what is known as the "stellitado" method which consists of melting a compound of metals (cobalt base) and applying it in the form of drops into a groove previously formed on the point of the tooth, so that the drop of metal replaces the point of the tooth.

This work has to be done by specialized operators who know the behaviour of this type of material and that of the saws.

The melting of the drop of hard metal has to be carried out in the immediate vicinity of the saw tooth, and the latter is completely subjected to the action of the blow torch or source of heat applied to achieve the melting. This is translated into a modification of the intrinsic characteristics of the material of the band saw which has to be treated subsequently to return it to the original characteristics.

The drop of metal has to be surfaced afterwards by successive passes of the grinding wheel to shape the cutting point of the tooth, and for which it is necessary to eliminate a very high percentage of the material; material that is totally wasted.

Studies carried out on the behaviour of band saws have contributed to determining the possibility of incorporating preformed elements into the teeth of band saws which elements, being inserted into the tooth, replace the cutting point and permit providing the band saw with the operational efficiency that, as we have already said, has been achieved with other tools.

This has been extensively described by the Applicant in the purpose of application for Patent of Invention No 476,910.

The said purpose makes it possible to obtain, and this has been demonstrated in practice, a pre-formed reinforcing element which, due to its constitutional characteristics, can be inserted into a groove formed on a line that coincides with the line that bisects the angle of grinding of the tooth so that, when this reinforcing element has been fixed there, with the aid of a conventional means of joining, it permits the successive grinding of the tooth, also conventionally, until the core is worn out.

And it is to be pointed out that this innovation, apart from eliminating the cost of placing a drop on the tooth of a saw and apart also from eliminating some of the risks involved with the high temperature by means of which the placing of the drop must be carried out, it permits reinforcement of the teeth of a saw in the place where it is being used, by conventional means, and without the aid of highly skilled operators.

However, in the practical use of the subject of the above mentioned Patent Application No. 476,910, the possibility of improving its function has been discovered. On the one hand the conclusion has been reached that it would be advisable to provide the teeth of the saw with a uniform cutting edge in relation to the thickness of the reinforcing element in order to obtain a better evacuation of sawdust.

On the other hand, the advisability has also been discovered of prolonging the extension of the lateral faces that determine the reliefs, to be exact, on their coinciding with the rounded posterior end of the point-core, when it is in the last phase of usefulness as a consequence of successive grindings to which it has been subjected, and which have caused the consequent wear of the walls, therefore reducing the surface of adherence of the reinforcing element on the saw tooth.

And, endeavouring to obtain a total reinforcement of the upper part of the tooth which, at the same time, helps to keep the point-core in optimum operating condition, it was decided to extend the said lateral faces of the reinforcing element and consequently the walls that define them, until coinciding on the upper part of the tooth with the boss of the said tooth.

The results are, in summary, an improvement with respect to the subject of the above-mentioned Patent Application No. 476,910 in accordance with which the walls which, together with the core, shape the throat that affects the contour of the one-piece body in relation to the point of the tooth, and which does not affect the point itself, are extended basically on their lower-anterior part on the lateral faces of the tooth until they coincide in front with the cutting edge of the tooth, so that they form a common cutting edge of the tooth. The said walls are extended considerably with the rounded end of the point-core and finally the same walls extend on their upper posterior parts over the lateral faces of the tooth, until they coincide on top with the edge of the boss of the tooth.

The final result, as we shall see later with the aid of

the drawings that illustrate this memorandum, is a true one-piece reinforcement of the upper part of a saw tooth, which reinforcement includes a point-core that remains constant throughout successive grindings of the tooth, two lateral walls that cover on both faces the area of the tooth comprised between the sides of the grinding angle of the tooth and point proximal to the rounded end of the point-core, and which faces, on their lower anterior edge coincide with the cutting edge of the tooth and from there they are inclined backward originating the reliefs of the tooth, which reliefs are complemented by an inclination also provided to the said faces, backward and downward from the upper posterior edge.

Provision has been made for the possibility that the edges of the reinforcing element that are adjusted over the lateral faces of the tooth, are slightly curved toward the axis of symmetry of the unit so that they act with a gripping movement and therefore with the effect of adjusting on the faces of the tooth, when the reinforcing element is inserted on the said tooth, completely trued and with the angular values made with great precision, and which determine a perfect finish of the cutting faces.

As an example of practical embodiment of the invention described, drawings are attached to this memorandum, the descriptions of which are the following:

Figure 1 - Represents a perspective of the element in accordance with the characteristics established. In this Figure the core - 1 is seen, whose anterior extremity - 2 -, is shaped according to the grinding angle and which is constituted into a point of a tooth on its being inserted into the saw tooth, while its opposite end - 3 - is rounded. The lateral faces of the core are extended, forming a throat - 4 - that involves the whole of the contour of the element, except the point. These walls are extended basically along their lower anterior part - 5 -, until they coincide on their front edge - 6 - with the cutting edge of the tooth. On its lower rear part - 7 - it is considerably extended in the area that coincides with the rounded end - 3 - of the core, in order to ensure the securing and stability of the point-core when at its smallest usable size. The upper posterior part - 8 - extends until it coincides on the top - 9 - with the edge or boss of the tooth. The planes of these walls determine the lateral reliefs.

Figure 2 - Represents the same perspective of the reinforcing element inserted into the groove formed in the saw tooth - 10 -. We see how the anterior edges - 6 - of the lateral walls - 5 - of the element cover the lateral areas of the tooth coinciding on its edge with the cutting edge - 11 - of the tooth itself. In the same way the upper edge - 9 - of the lateral walls - 8 - of the element coincide with the upper edge of boss - 12 - of the tooth. The planes - 13 - and - 14 - of the dihedral that forms the point of the core are arranged respectively as an integral part of the cutting edge - 11 - of the tooth together with the front edges - 6 - of the extensions - 5 - of the walls of the element, in one case, and of the edge or boss of the tooth - 12 - together with the upper edge - 9 - of the extension - 8 - of the walls, in the other case.

Figure 3 - Corresponds to the elevation of a saw

tooth with the reinforcing element inserted. Stating with the original profile of the tooth, to whose grinding angle the said inserted element is adjusted, an example of the result of successive grinding operations is shown in successive broken lines in which the point-core and its walls are diminished at the same time that the tooth is reconstituted. The unbroken line a-b establishes approximately the point of maximum use of the point-core which remains constant as the point of the tooth.

Figure 4 - Shows an elevation of a tooth in which the inserted element is at the point of maximum use, in accordance with Figure 3. Part of the lateral walls is retained and all the area of the walls corresponding to the lower posterior extension - 7 - that determines the permanent securing and stability of the element until the practical termination of the core in use as a constant point of the tooth.

Figure 5 - Represents an elevation, profile and plan view of the reinforcing element, inserted into the groove formed in the saw tooth in the approximate direction of the line that bisects the grinding angle. Its characteristics correspond to that shown in Figures 1 and 2.

Figure 6 - Represents an elevation, profile, and plan view of the inserted reinforcing element which retains the characteristics described. In the specific case shown the walls of the upper posterior part - 8 - have been limited to an exact overlap on the upper edge of the groove. This limitation of the said walls has the sole purpose of reducing, as required, the volume of reinforcing material used for shaping the reinforcement.

Figure 7 - Finally, this Figure also shows an elevation, profile and plan view of the said reinforcing element in which the walls of the upper posterior part have been diminished in order to obtain a reduction in accordance with the joining means used, of the volume of material of the reinforcing element.

In the three cases considered in Figures 5, 6, and 7, the basic characteristics of the element are not in any way modified, since the lower anterior extension of the walls retains its characteristics function of forming part, on its front edges, of the cutting edge of the tooth, and the lower posterior extension keeps the element secure when, because of successive grinding operations, it is limited to its smallest dimension.

As a consequence of these basic characteristics an improvement is achieved in the output of sawdust, the product of wood sawing, since the cutting edge of the tooth provides maximum capacity for impeding lateral emissions of sawdust.

They make possible the exhaustion of the point-core of the tooth to the maximum extent, since it is rigidly secured until its size is the smallest that can be used.

It should be stressed that the effect of the complete reinforcement of the tooth may be highly desirable in spite of the fact that the one-piece body, which reinforces the entire upper part of the tooth, requires a larger amount of material, on the other hand, the stresses foreseeable in this zone of the tooth are not increased at all as a result of the insertion.

Obviously as has been explained, the preparation of this reinforcement element permits its easy application on the saw by operators who are not highly skilled and, what is more important, it permits the replacement of damaged elements practically in situ during work, that is to say in the sawmill itself, for which the operations to be carried out will be the following : take off the broken element and insert a new one with the aid of conventional means of joining, reducing the elements individually replaced to conform to the length of the rest of the points of the saw at that time.

Finally it should be noted how the reinforcement element thus shaped constitutes a true "drop" of reinforcing material provided onto a saw tooth which drop is completely reformed with the final characteristics that the said reinforcing element must have without the need, at the time of installing it on the saw, to resort to complicated, slow, and costly operations which the placement of the said drop involves in accordance with the known cases.

In practice the user who has a suitable grinding machine may groove the point of the tooth, following the instructions given for the purpose, of better, all of the points of the teeth of a saw in a continuous cycle and successively, having the reinforcement element that is the basis of this Patent Application to insert in the said grooves with the aid of a conventional joining element, such as glue, thermal or plastic welds, etc.

There is no possibility of the reinforcing element being inadequately inserted in the tooth of the saw, since the rounded end of the point-core has to coincide exactly with the rounded bottom of the groove in which it is housed, which unavoidably determines the correct positioning of the point, cutting edge, and boss of the element.

The reinforcing element considered in this memorandum is made in one piece since it is a question of a pre-formed element which, even though it has been obtained in one or more pieces, assembled together and in one or more operations of moulding and/or machining and rough-machined, for the purpose of insertion it is a single piece which comprises the point-core and the lateral walls and which is inserted by simply sliding the point-core into the pertinent groove formed in the saw tooth.

CLAIMS

1. A reinforcing element for saw teeth of the type constituted by a one-piece body intended to be inserted as a point into the groove formed approximately in accordance with the line that bisects the grinding angle of the tooth of a saw, and which body includes a point-core (1) shaped on its anterior end (2) in accordance with the grinding angle, rounded on its posterior end (3), and the lateral faces (5) contained in convergent planes that define the lateral reliefs, and which lateral faces, together with the point-core, define a throat (4) that involves the whole of the contour of the one-piece body except the point, the walls of which throat are intended to overlap the edges of the groove formed in the saw tooth, the lower anterior part (7) of the walls (5) which,

together with the core (2), shape the throat (4), that involves the contour of the one-piece body, as a point, except the point itself, being basically laid on the lateral faces of the tooth, until they coincide in front with the cutting edge (11) of the tooth so that with it they form a common cutting edge.

2. A reinforcing element according to claim 1, wherein the above-mentioned walls are considerably extended on their lower posterior edge, coinciding with the rounded end of the point-core to ensure the securing and stability of the point-core at its smallest usable size.

3. A reinforcing element according to claim 1 or 2, wherein the upper posterior part of the above-mentioned walls are laid on the lateral faces of the tooth, until they coincide on the top with the edge of the boss of the tooth, so that the unit is constituted into a reinforcement which, including a permanent point of the tooth throughout successive grinding operations, also covers the upper zone of the tooth on both faces permanently throughout the said successive grindings in an area comprised between the sides of the grinding angle and a point located on the line that approximately bisects the same grinding angle.

4. A reinforcing element for saw teeth, substantially as hereinbefore described with reference to the accompanying drawings.

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