

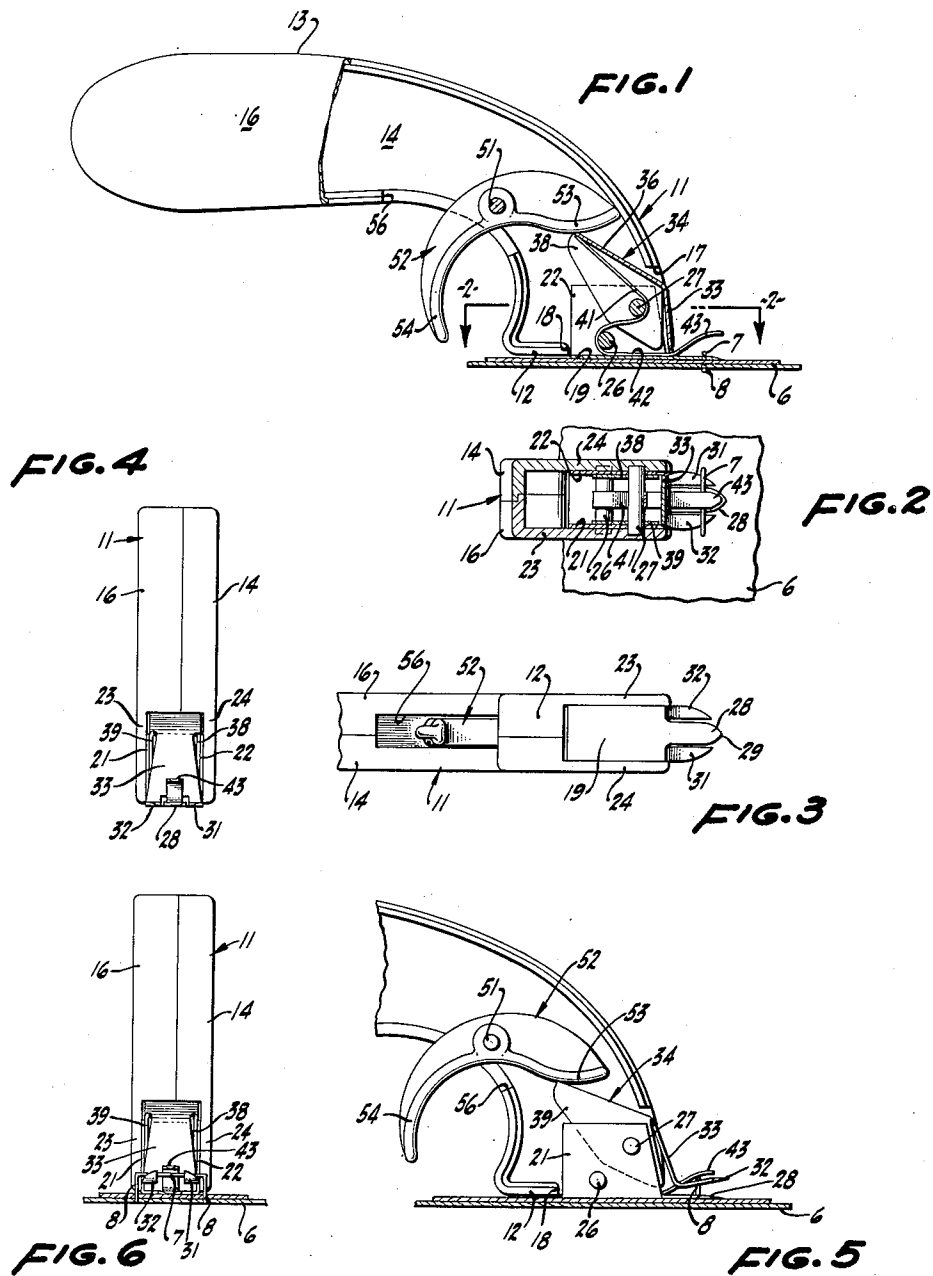
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STAPLE REMOVER

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STAPLE REMOVER

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My invention relates to devices useful in removing staples from one or more sheets of paper to which they have been affixed. Staples ordinarily are formed of a band of wire or metal partly lying just above the surface of a sheet of paper and provided with prongs at each end which pierce the paper and are clinched on the reverse side thereof. Various implements and means are utilized for removing such staples when desired and it is the general object of my invention to provide an improved staple remover for this general purpose.

Another object of my invention is to provide a staple remover which is easily utilized as a desk tool and is readily operated by a user with little or no difficulty in engaging the staple and removing it.

Another object of the invention is to provide a staple remover which confines the staple being removed so that it does not fly indiscriminately through the air and so that it can be disposed of into an appropriate receptacle.

Another object of the invention is to provide a staple remover having a natural grip for ease of use.

A still further object of the invention is to provide a staple remover which is simple mechanically and easy and economical to manufacture so that it can be furnished at a relatively low price.

Another object of the invention is to provide a staple remover effective to remove staples even under adverse conditions.

A still further object of the invention is to provide a staple remover in which considerable force can readily be exerted by the user in order to remove even staples which have been tightly clinched.

Other objects, together with the foregoing, are attained in the embodiment of the invention described in the accompanying description and illustrated in the accompanying drawings, in which:

Figure 1 is in part a side elevation of a staple remover constructed in accordance with my invention and shown in staple engaging position, and in part is a cross section on a vertical median plane through the staple remover.

Figure 2 is a cross section, the plane of which is indicated by the line 2—2 in Figure 1.

Figure 3 is a bottom elevation of the structure shown in Figure 1, a portion of the handle being broken away to reduce the size of the figure.

Figure 4 is a front elevation of the staple remover of Figure 1 and shown in the position of Figure 1.

Figure 5 is a cross section comparable to Figure 1 but showing the staple remover in the staple extracting position.

Figure 6 is a front elevation comparable to Figure 4 but showing the staple remover in the position of Figure 5.

In its preferred form, my staple remover is designed especially for use with staples of the sort which pass through a sheet 6 of paper or the like and include a central, generally horizontal portion 7 of wire or the like having a pair of downturned ends 8 clinched on the bottom of the sheet. The staple remover itself includes a frame 11 having a generally planar base 12, the plane of

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which is designed to be almost exactly coincident with the plane of the paper sheet 6 so that the staple remover has a firm support on the paper, particularly when the paper is resting on a desk or the like. The base 12 is approximately rectangular in plan and extends upwardly and rearwardly to merge with a handle 13 shaped to afford an appropriate grip for the user's hand. The frame 11 is preferably fabricated of a pair of interfitting or partly telescoping halves 14 and 16 conveniently moulded of plastic or the like for good feel and light, economical construction. The interior of the handle is preferably hollow so that much of the weight of the staple remover is adjacent the base 12.

The forward portion of the frame 11 is provided with an aperture 17 and the base portion is provided with a connecting aperture 18. Filling the apertures and situated within the frame 11 is a metal foot 19 in effect constituting a portion of the frame. The foot 19 is formed of a sheet of metal having a pair of side walls 21 and 22 bent upwardly to lie snugly within the side walls 23 and 24 of the frame 11. The foot 19 is held in position by a pair of through rods 26 and 27 extending laterally beyond the sides of the foot and received in recesses in the material of the frame 11. There is thus provided an interlocking relationship between the walls 23 and 24 of the frame halves and the foot 19 to hold the foot in position, although invisibly so since the recesses in the walls 23 and 24 do not extend entirely therethrough.

As part of the foot 19, considered as a portion of the frame, there is provided an extension in the form of a central prong 28 relatively thin in vertical dimension and relatively narrow in transverse dimension with respect to the transverse dimension of the staple portion 7. The prong 28 is provided with a narrowed point 29 also thinned nearly to a dull, knife edge. As the staple remover is advanced over the surface of the sheet 6 with the foot 19 and the base 12 nearly or firmly in contact with the paper, the prong easily enters under the transverse portion 7 of the staple and becomes interposed between the staple and the paper.

In accordance with my invention and to cooperate with the central prong 28, I provide a pair of lifting tines 31 and 32 of approximately the same vertical dimension as the central prong and together with the prong making up a transverse dimension approximately that or slightly less than that of the staple 7. The two lifting tines are formed preferably as forward extensions of the front wall 33 of an extracting lever, generally designated 34. This lever is a metal configuration including a top wall 36 joined to the front wall 33 and having a pair of downturned ears 38 and 39 pierced and engaging the rod 27 as a pivot mounting.

The pair of lifting tines 31 and 32 are movable from a first, lower position co-planar or substantially so with the central prong and with the foot 19 of the base, into a second, upper position remote from the central prong and lifted therefrom as shown in Figure 5. The operation of the lever 34 between those two positions is effective to lift the staple 7 from its clinched position, the material of the staple deforming for that purpose, and actually extracts the staple from the sheet 6.

The lever 34 is preferably normally in its co-planar first position and I provide a spring means for urging the lever into that position. Conveniently, a leaf spring 41 of approximately S shape is disposed with one end confined in the channel formed by the upper wall 36 of the extracting lever and the ears 38 and 39 depending therefrom. The spring 41 is turned around the rod 27 and is also curved around the rod 26. This mounting serves to secure the spring in its operating position. The spring extends through a flat portion 42 overlying the foot 19 and as it emerges through the aperture 17 it is turned

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upwardly to provide a spring finger 43 overlying and spaced from the central prong 28.

The spring as so arranged has at least two functions. It is effective to urge the lever 34 with respect to the frame toward its lower-most position with the lever resting against the foot 19 and with the pair of lifting tines both planar with the central prong. The spring 41 is also effective, particularly the spring finger 43, to overlie the staple 7 when the prong and tines are engaged therewith and to confine the staple being removed as the tines lift it away from the sheet 6. Without the spring finger 43, the remover acts to remove the staple but often the staple suddenly parts from the sheet and away from the remover and flies around becoming lost or even causing injury.

The spring finger 43 acts as a restraining keeper so that, as shown in Figure 5, a removed staple is gripped between the upper surface of the lifting tines and the lower surface of the spring finger. The spring finger is sufficiently resilient so that staples of different size and in different positions are still well retained, the extreme end of the spring finger being slightly recurved to act particularly as a tensioned retaining device. When the lever 34 is released so that the spring 41 is effective to return it to its initial position, the removed staple is no longer pressed against the spring finger 43 and upon a suitable manipulation of the remover can be dropped into a suitable receptacle.

While the lever 34 can be directly actuated by the user, I prefer to provide a means which is capable of imparting considerable power to the lever yet with a natural movement by the user. To that end, the two halves of the handle are bridged by a rod 51 serving as a pivot pin for an index finger lever 52. This is conveniently formed of plastic material and has a forward cam portion 53 rocking upon the upper surface 36 of the lever 34. The index finger lever 52 also has a finger portion 54 protruding in a convenient location through an aperture 56 formed between the halves of the handle 13.

In practice, a user picking up the staple remover and grasping the handle 13 in his hand has his index finger fall quite naturally upon the finger portion 54. With the staple remover so gripped it is easily urged forwardly, when in the Figure 1 position, into engagement with a staple as described. With the user's index finger pulling the index finger lever, considerable power can be applied to extract a staple, even one which has been well clinched through a large packet of papers. The removed staple, being retained temporarily in the remover, is released as the index finger lever 52 is released, the spring 41 being of adequate power not only to restore the lifting tines from their raised position to their co-planar position but also having adequate force to restore the lever 52 to its normal location.

What is claimed is:

1. A staple remover comprising a hollow frame, a prong fixed on and projecting centrally from said hollow frame, a spring having a central finger projecting from said hollow frame in a location overlying and spaced from said prong and having a portion extending into said hollow frame, a pair of lifting tines disposed on opposite sides of said prong, an extracting lever within said hollow frame and integral with said lifting tines, means for pivoting said extracting lever on said hollow frame in a position to move against said portion of said spring, an index finger lever extending into said hollow frame into engagement with said extracting lever and extend-

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ing out of said hollow frame, and means for pivoting said index finger lever in said frame.

2. A staple remover comprising a hollow frame in the shape of a handle and having a planar base, a prong fixed on and projecting centrally from said hollow frame substantially coplanar with said base, a spring finger projecting centrally from said hollow frame in a position overlying and spaced from said prong, a pair of lifting tines disposed on opposite sides of said prong and in one position thereof substantially coplanar with said base, an extracting lever within said hollow frame and integral with said lifting tines, means for pivoting said extracting lever on said hollow frame, an index finger lever extending into said hollow frame in a location to cam against said extracting lever and extending out of said hollow frame in a location for operation by the index finger of a user grasping said hollow frame, and means for pivoting said index finger lever on said frame.

3. A staple remover comprising a hollow frame in the shape of a handle conformed for holding in one hand of the user, a base on said hollow frame, a central prong fixed with respect to said hollow frame and projecting from said base, an extracting lever within said hollow frame, means for pivoting said extracting lever on said frame, a pair of lifting tines projecting from said extracting lever out of said hollow frame and disposed on opposite sides of said central prong, a leaf spring within said hollow frame and engaging said hollow frame and said extracting lever for urging said tines into a position substantially coplanar with said prong, an extension on said leaf spring constituting a spring finger projecting from said hollow frame and overlying said prong, and an index finger lever pivoted in said hollow frame, said index finger lever having one portion within said hollow frame in camming engagement with said extracting lever and having another portion projecting from said hollow frame in position to be engaged by the index finger of said one hand of said user.

4. A staple remover comprising a hollow frame in the shape of a handle and having a base, a prong fixed on and projecting from said base, an extracting lever having a pair of lifting tines disposed on opposite sides of said prong outside of said hollow frame, means mounting said extracting lever within said hollow frame for movement between a fixed position with said tines substantially coplanar with said prong and a second position with said tines away from said prong, a spring within said hollow frame for urging said tines toward said first position, and an index finger lever pivoted on said hollow frame, said index finger lever having a portion within said hollow frame in operative engagement with said extracting lever for overcoming said spring and moving said tines into said second position, and said index finger lever having another portion projecting from said hollow frame toward said base in a position to be engaged by the index finger of the hand of a user grasping said handle.

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